

**MEETING AGENDA:
ECOLOGICAL CHEMICALS OF CONCERN SCREENING,
WOMAN CREEK AND WALNUT CREEK ECOLOGICAL RISK ASSESSMENTS
May 31, 1995**

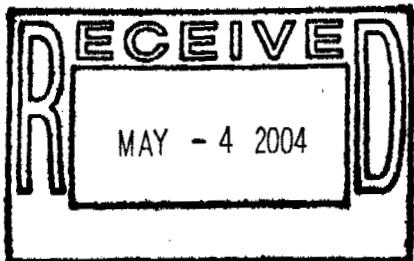
I. INTRODUCTION AND OVERVIEW OF SCREENING PROCESS

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- B. Approach, Scope, and Overview of Methods
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 - 2. Data acquisition and cleanup
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 - 4. Exposure Estimation
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- B. Intake Estimations
- C. Toxicity Reference Values
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ADMIN RECORD

BZ-A-000703

A. DATA USES AND ERA OBJECTIVES

The functions of Superfund baseline ERAs are to (EPA 1994):

- (1) *"document whether actual or potential risk exists at a site;*
- (2) *screen the contaminants present at a site for those that might pose an ecological risk, thereby focusing further efforts; and*
- (3) *generate data to be used in evaluating clean-up options."*

In order to support these functions, the objectives of the ERA include:

- *Identify the ecological receptors potentially at risk;*
- *Estimate exposure of receptors to PCOCs and the risk associated with the exposures;*
- *Characterize existing impacts at the appropriate level of biological organization;*
- *Characterize the overall ecological risk resulting from existing impacts and estimated exposures;*
- *Provide information necessary to evaluate benefits and costs of remedial alternatives*

RFETS ECOC SCREENING PROCESS

Woman Creek and Walnut Creek ERAs are largely "source driven" (Suter 1993) in that known or suspected contaminant source areas have been identified, but there were no overt signs of ecotoxicological stress that could be attributed to contaminants.

The initial phase of the ERAs needed to focus on identifying chemical contaminants that were present at potentially ecotoxic concentrations.

More than 170 potential chemicals of concern (PCOCs) had been identified from the RFI/RI activities in operable units 1, 2, 5, 6, 7, 10, and 11.

An effective means was needed for screening the PCOCs to determine which were present at potentially ecotoxic concentrations

The specific objectives of the ECOC screening process:

- *Perform screening-level exposure and risk calculations for potential chemicals of concern (PCOCs) to determine which PCOCs are present at potentially ecotoxic concentrations and those that represent negligible, or de minimus, ecological risk.*
- *Identify the chemicals, environmental media, and geographic areas that contribute most to risk for a given receptor or group.*
- *Identify ECOCs for which further analysis is needed to refine risk estimates or to help establish remediation strategies.*

B. APPROACH, SCOPE, AND OVERVIEW OF METHODS

1. Receptors/pathways

Conceptual exposure models were developed based on the nature and distribution of PCOCs in abiotic media.

The conceptual model identified potential exposure pathways and the types of ecological receptors that might be exposed to PCOCs.

Representative receptor taxa were identified to represent functional groups in preliminary exposure and risk estimates. Candidate receptor species and life history characteristics were identified in Technical Memorandum No. 2 - Sitewide Conceptual Model

2. Data acquisition and cleanup

A database was obtained from RFEDS that included all abiotic and biotic samples used in RFI/RI "nature and extent" evaluations. Only data from samples collected after December 31, 1989 was used. Data were subjected to a uniform "cleanup" routine to ensure that exposure estimates were comparable among source areas and operable units.

3. Data aggregation

Under an agreement with EPA and CDHPE, ERAs would be performed on a watershed scale. The ERA study areas include all or parts of 7 operable units and many individual hazardous substance sites. In order to make the ERA results more useful assigning risks to specific OUs, IHSSs were grouped into sixteen ERA source areas, to aid in identifying areas with the greatest risk. Source area boundaries were identified, in part, based on abiotic and biotic sampling locations in the area.

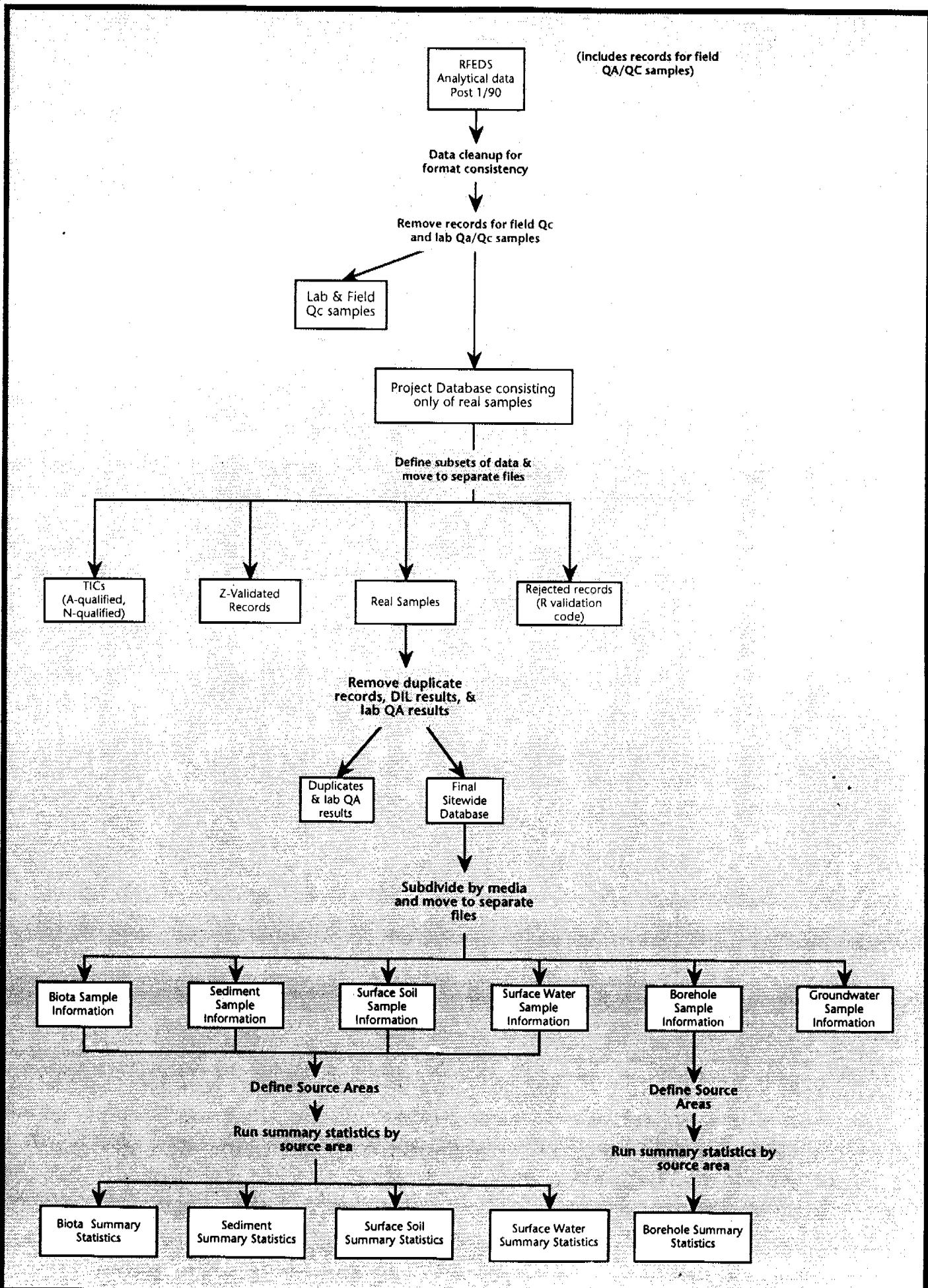
Data from sample locations within each source area were used in estimating exposure point concentrations. In most cases, a 95 percent upper confidence limit of the mean (UCL_{95}) was calculated for each PCOC in each environmental medium. The UCL_{95} values were calculated using one-tailed procedure (Gilbert 1989) and assuming normal distributions.

In some cases, the maximum detected concentration reported was used at the exposure point estimation

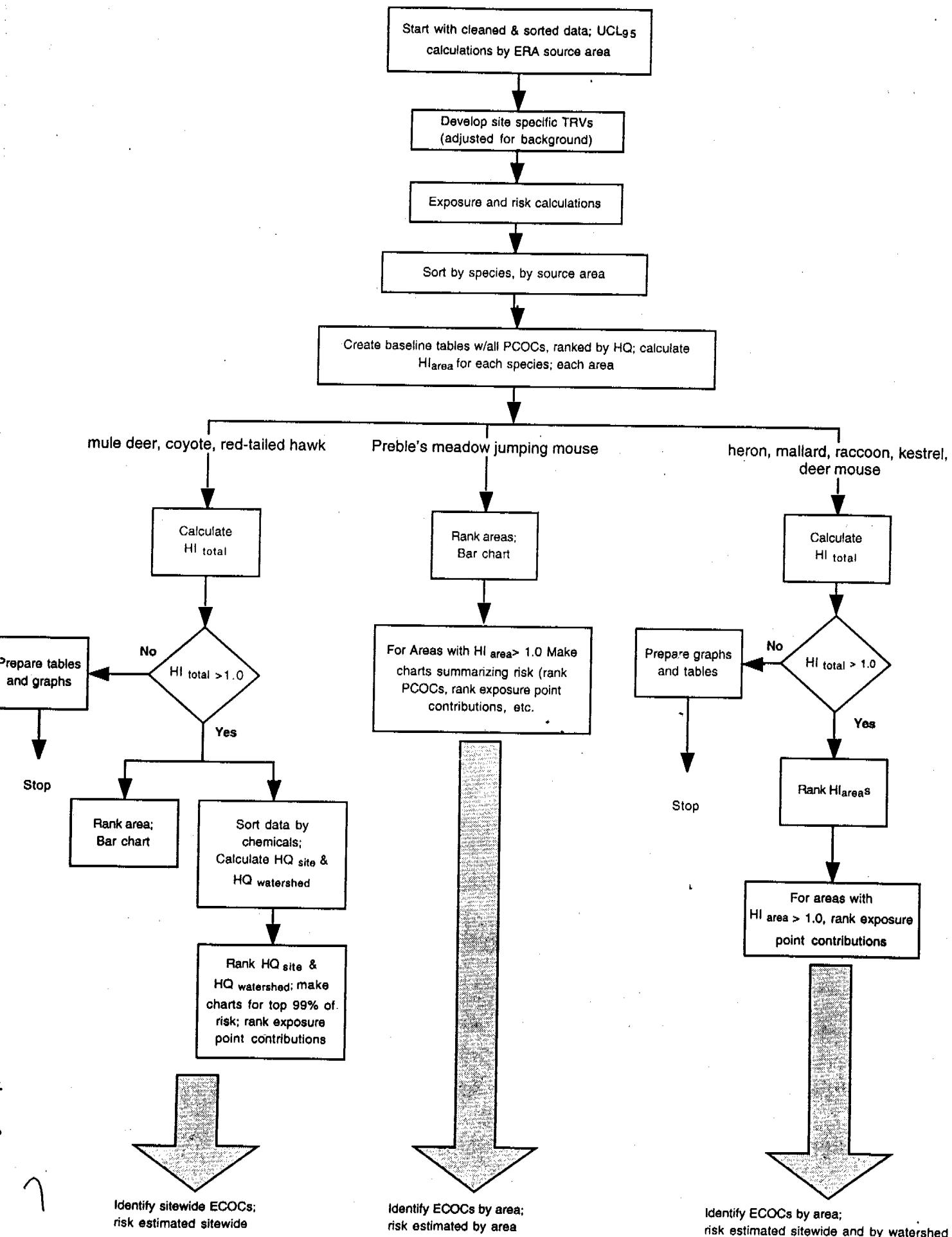
Conceptual Exposure Model for Receptors

<u>Species</u>	<u>Exposure Routes</u>	<u>Exposure Points</u>
Limiting Species		
Preble's meadow jumping mouse	Ingestion	Surface soil Surface water Vegetation Terrestrial arthropods
	Inhalation	Air in burrows
American kestrel	Ingestion	Surface soil Small mammals Terrestrial arthropods
Great blue heron	Ingestion	Surface water Sediment Fish
Mallard	Ingestion	Surface water Sediments Fish Benthic macroinvertebrates Vegetation
Vegetation	Direct Contact	Subsurface soil
Aquatic life	Direct Contact	Surface water Sediment
Wide-Ranging Species		
Coyote	Ingestion	Surface soil Surface water Small mammals Vegetation
Mule deer	Ingestion	Surface soil Surface water Vegetation
Red-tailed hawk	Ingestion	Surface soil Surface water Small mammals

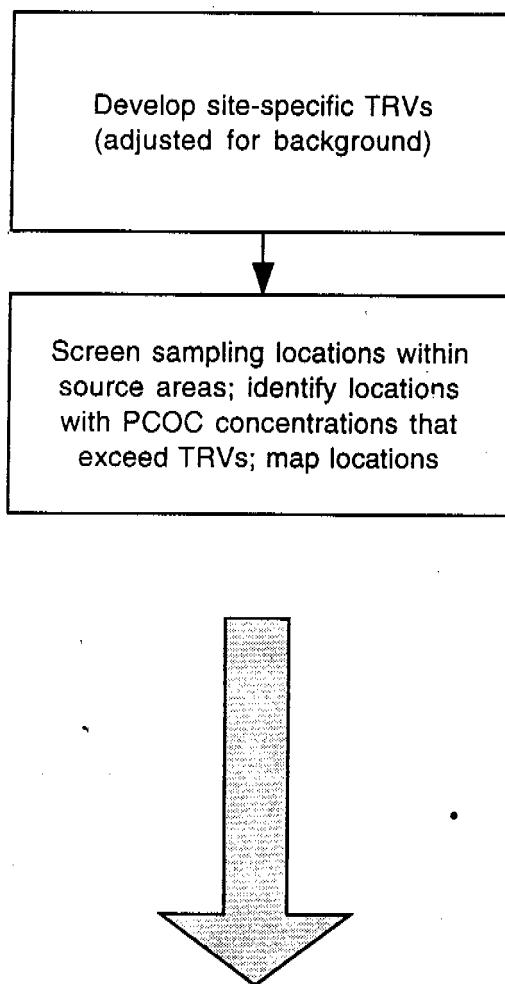
Cleanup Routine for Analytical Data: Site Wide Ecological Risk Assessment



Wildlife ECOC Screening Process at RFETS



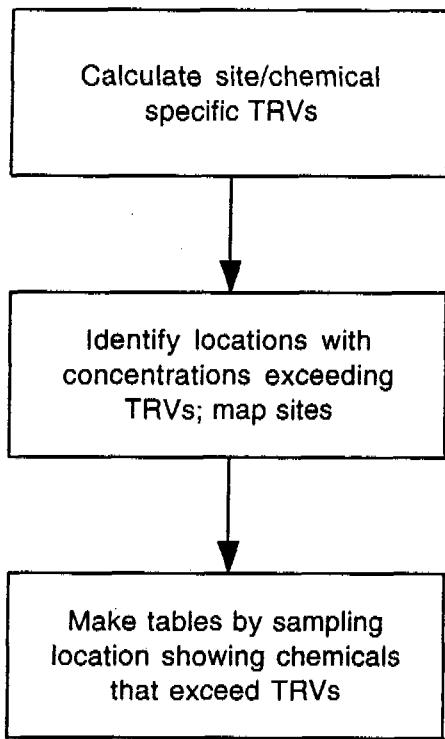
Vegetation ECOC Screening Process at RFETS



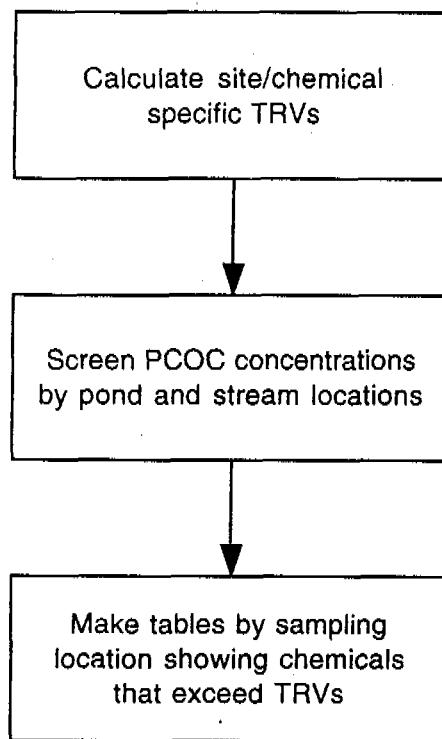
Identify sitewide ECOCs based on potential toxicity in sensitive habitats (e.g., wetlands) and proportion of communities affected.
Extent of habitat affected is determined using Thiessen polygons within source areas

Aquatic Receptors ECOC Screening Process at RFETS

Sediments



Surface Water



3. Exposure Estimation

Wildlife — exposures were estimated for each species in each ERA source area. Estimates were weighted for receptors home range and resource availability within each source areas. The UCL₉₅ was used as exposure point concentration in most cases.

Vegetation — exposures estimated for direct contact with soil. Exposure and risks were estimated from the UCL₉₅ and maximum detected concentrations for borehole data in each source area.

Aquatic Life — Surface Water — Exposures and risks were estimated for direct contact with surface water. The UCL₉₅ for metals (dissolved) and organics (total) for a source area was used as the exposure point concentration.

Aquatic Life — Sediments — Exposures and risks were estimated for direct contact with surface water. The UCL₉₅ was for a source area was used as the exposure point concentration.

Exposure Estimation Methods

Wildlife

PCOC intake from each exposure point

$$\text{Intake} = \text{IR}_i * \text{SUF}_x * C_i$$

where: IR_i = ingestion rate for medium/exposure point i

SUF_x = site use factor for source data area x

C_i = concentration of PCOC in medium i ; unless otherwise noted, C is UCL_{95} for source area

Intakes from each medium within a given source area are summed to estimate total intake for the area. For wide-ranging species, intakes from areas are summed to estimate uptake from site.

Vegetation

Exposure estimated for direct contact with subsurface soil. Concentration of PCOC in bulk soil samples are used as exposure point concentrations.

Aquatic Life

Exposure estimated for direct contact with surface water and sediments. PCOC concentrations in surface water (dissolved) and sediment used as exposure point concentrations.

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Biota Data Available for Sitewide Ecological Risk Assessments

OU	Source Area	Small Mammals			Vegetation ¹			Terrestrial Arthropods			Fish ²			Benthic Macroinvertebrates ²		
		M	R	P	S	M	R	P	S	M	R	P	S	M	R	P
OU1	881 Hillside	M	R	--	--	M	R	EP	ES	M	R	--	--	M	R	--
OU2	903 Pad Area	M	R	--	--	M	R	EP	ES	M	R	--	--	---	---	---
OU2	East Trenches Area	M	R	--	--	M	R	--	ES	M	--	--	---	---	---	---
OU2	Mound Area	--	--	--	--	--	--	EP	ES	--	--	--	---	---	---	---
OU5	Ash Pits	M	R	--	--	M	R	--	ES	M	R	--	---	---	---	---
OU5	C-Ponds	M	R	--	--	M	R	--	ES	M	R	--	---	---	---	---
OU5	Old Landfill	M	R	--	--	M	R	EP	ES	--	--	---	---	---	---	---
OU5	Surface Disturbance	--	--	--	--	--	--	--	--	--	--	---	---	---	---	---
OU6	A-Ponds	M	R	P	--	M	R	P	ES	--	--	---	---	---	---	---
OU6	Burial Trenches	M	R	--	--	M	R	--	ES	--	--	---	---	---	---	---
OU6	B-Ponds	M	R	--	--	M	R	P	ES	--	--	---	---	---	---	---
OU6	Soil Dump Areas	M	R	--	--	M	R	EP	ES	--	--	---	---	---	---	---
OU6	North Spray Field	--	--	--	--	M	R	--	--	--	--	---	---	---	---	---
OU7	Downgradient Areas	M	R	--	--	M	R	--	--	---	---	---	---	---	---	---
OU10	Other Outside Closures	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---
OU11	West Spray Field	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---

¹Concentration of organic compounds in vegetation estimated from K_{ow} and methods in Travis and Arms (1988).

²Concentration of metals and organics estimated from bioconcentration factors.

M - metals data

R - radionuclide data

P - pesticide/PCB data

|- incomplete pathway

--- - unable to estimate concentrations

METHODS FOR ESTIMATING UPTAKE OF CONTAMINANTS IN BIOLOGICAL TISSUES

Vegetation

The concentration of organic PCOCs in vegetation was estimated using the following equation (Baes *et al.* 1984):

$$U = B * C_s$$

where:

U = uptake ($\mu\text{g}/\text{kg}$)

B = transfer coefficient (unitless)

C_s = concentration of contaminant in soil

The transfer coefficient, B, is calculated from the K_{ow} using the following equation (Travis and Arms 1988):

$$\log B = 1.588 - 0.578 \log K_{ow}$$

Aquatic Prey Species

For aquatic prey species, the bioconcentration factor (BCF) was used to estimate accumulation of contaminants from surface water:

$$\text{Tissue Conc.} = BCF * C_w$$

where: C_w = PCOC concentration in surface water (dissolved for metals, total for organics)

If a literature-based BCF was not available for a give PCOC, it was estimated using the following equation (Lyman *et al* 1982):

$$\log BCF = 0.76 \log K_{ow} - 0.23$$

EQUILIBRIUM PARTITIONING METHOD FOR ESTIMATING SEDIMENT QUALITY CRITERIA FOR ORGANIC COMPOUNDS

Sediment TRVs for organic compounds was calculated using EPA's equilibrium partitioning approach to estimating sediment quality criteria (EPA 1992):

$$SQC = K_p * WQS$$

where:

SQC = sediment quality criterion

K_p = sediment-water partition coefficient

K_p was estimated from the carbon-water partition coefficient (K_{oc}) and fraction of organic carbon in sediments (f_{oc}):

$$K_p = f_{oc} * K_{oc}$$

K_{oc} was estimated from the octanol-water partition coefficient (K_{ow}):

$$\log_{10}(K_{oc}) = 0.00028 + 0.983 \log_{10}(K_{ow})$$

Note: Interim SQCs are available for some PAHs, PCBs, and pesticides. These SQCs are expressed as an allowable mass of chemical per mass organic carbon in sediments (e.g., grams PCOC/gram carbon)

4. Risk Estimation and Characterization

Risks were estimated using the Hazard Quotient (HQ) and Hazard Index (HI) approaches.

Hazard Quotient (HQ): HQs are used to characterize risk from a single chemical (potential chemical of concern [PCOC]). The HQ may be based on exposures estimated from data aggregated from several areas and/or from several exposure pathways. The level of data aggregation used in calculating an HQ is indicated by a subscript:

HQ_{area} = The HQ for a single PCOC in a single ERA source area. For wildlife, this values includes intake from all exposure points in the source area.

HQ_{site} = Sum of all HQ_{area} values for a given PCOC across entire site

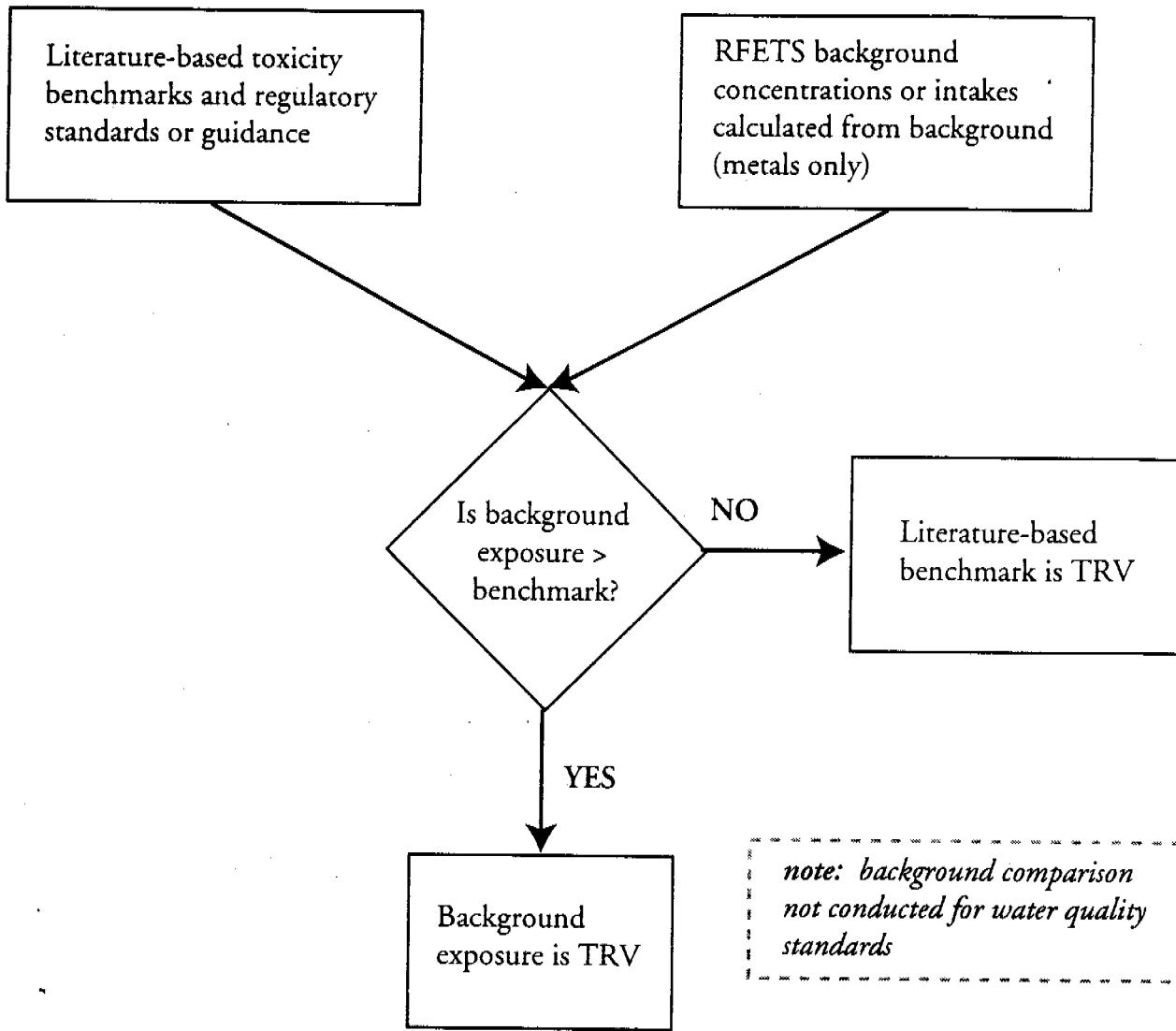
$HQ_{watershed}$ = Sum of HQ_{area} values for a given PCOC within a watershed

Hazard Index (HI): HIs are used to characterize cumulative risk from multiple PCOCs. The HI for a given source area is calculated by summing HQ_{area} values for the area. HIs for multiple areas are calculated by summing HI values for smaller units. The level of data aggregation included in the HI is indicated by a subscript:

HI_{area} = Sum of HQ_{area} values for a single ERA source area.

$HI_{watershed}$ = Sum of HI_{area} values for a watershed

HI_{total} = Sum of HI_{area} values for the entire site



Literature-based benchmarks for wildlife from:

1. Oak Ridge National Laboratory (ORNL)
2. Values developed from information in toxicological literature and ORNL methods

Water quality benchmarks from:

1. Colorado state water quality standards
2. EPA Ambient Water Quality Criteria
3. ORNL database

Sediment quality benchmarks from:

1. EPA interim sediment quality standards (SQCs)
2. EPA equilibrium partitioning approach
3. ORNL database
4. Site-specific SQCs developed for other CERCLA sites

Basic Assumptions and Risk Categories

1. All TRVs were derived to approximate the No-observed-adverse-effects-level (NOAEL)
2. The uncertainty factor used to estimate the NOAEL from Lowest-observed-adverse-effects-level (LOAEL) is 10. (i.e., NOAEL = 0.1 x LOAEL)

While this uncertainty factor is not based on regulatory statute, it is commonly used in ecological and human health risk assessment. Information available for laboratory animals indicates that LOAEL:NOAEL ratios are more typically 3.5 to 5.0 (Lewis et. al. 1990). The ratio of LC₅₀ to LOAEL is typically 5.0 to 6.0. Thus, the tenfold uncertainty factor appears to be sufficiently conservative.

[Lewis, S.C., Lynch, J.R., and Nikiforov, A.I. 1990. A New Approach to Deriving Community Exposure Guidelines from 'No-Observed Adverse-Effects-Levels'. Reg. Toxicol. and Pharmacol., 11:314-330.]

SUGGESTED GUIDELINES FOR INTERPRETING HQs AND HIs IN ECOC SCREEN:

Hazard Quotients:

- 1 HQ < 1.0 indicates exposures below the NOAEL and indicates *de minimus* risk; no further analysis is necessary
- 2 1.0 < HQ < 10 indicates exposures greater than the NOAEL but less than the LOAEL and indicates minimal and possibly *de minimus* risk; further analysis may be indicated if simultaneous exposure to other chemicals with HQ > 1.0 is probable.
- 3 HQ \geq 10 indicates exposures equal to or greater than the LOAEL and indicates potentially adverse effects may result; further analysis is required to better define risk
- 4 HQ > 50 indicates exposures may result in effect on a large portion of animals (e.g., LC₅₀) and represents significant risk; further analysis is required to better define risk and determine cleanup goals to mitigate risk

Hazard Indices:

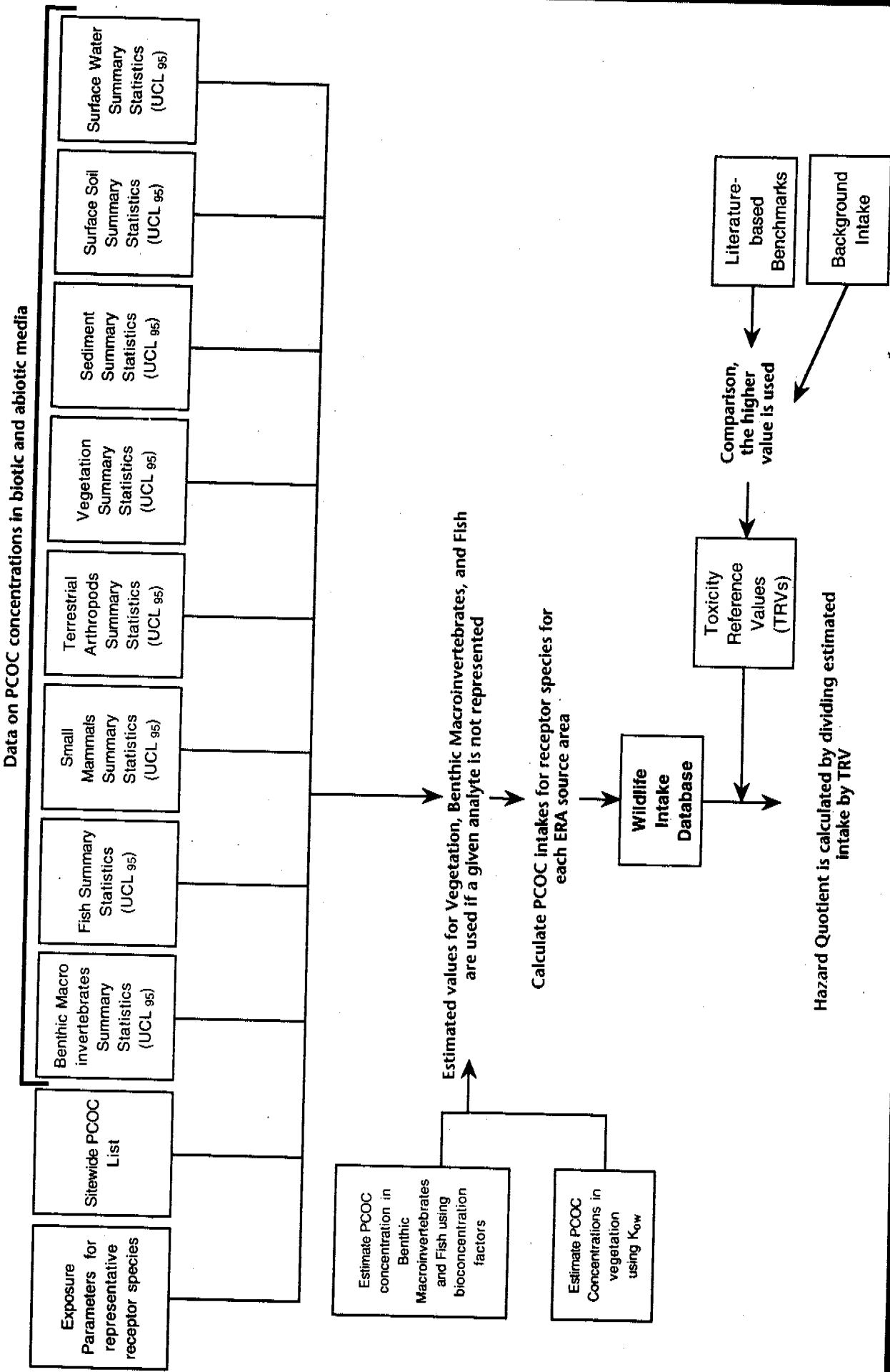
- A HI_{total} \leq 1.0 - *de minimus* or negligible risk
- B 1.0 < HI_{total} < 10 - minimal, possibly negligible risk
- C 10 < HI_{total} < 100 - potentially significant risk; refinement of risk estimates needed
- D HI_{total} > 100 - significant risk is probable; refinement of risk estimates needed especially to identify cleanup goals

RFETS ECOC SCREENING PROCESS

Circumstances that may require exceptions to strict application of the suggested criteria:

- PCOCs with an $HQ_{site} < 10$ but that are known to be very toxic or an especially important threat due to bioaccumulation
- naturally occurring metals with $HQ_{site} \geq 10$, but appear to be present in native materials and not result of contamination
- Organic contaminants, such as PAHs and PCBs that are relatively ubiquitous due to anthropogenic sources such as automobile exhaust or industrial emissions in the Denver metro area. Exposure to such chemicals should be considered when assessing cumulative risk.
- PCOCs that occur in ecologically important or sensitive areas such as wetlands, riparian areas, or critical habitat for protected species.

Conceptual Model for Use of Site Data and Literature Information in Exposure and Risk Estimates



Key Data Gaps and Methods for Replacing Data

Data Category	Specific Data Gap	Replacement Method	Remarks
Terrestrial System			
PCOC content of terrestrial arthropod (TA) tissues for use in estimating exposure of predators	TA data lacking for some areas; metal and radionuclide data available for some areas	Data not replaced unless site-specific data on uptake ratios are available from nearby areas	This decision reflects informal agreement with EPA. No adequate method for estimating uptake is currently available. Uptake of organics is minimal and metabolism is rapid. Potentially toxic chemicals not represented in tissue will be considered case-by-case.
PCOC content of small mammals (SM) tissues for estimating exposure of predators	SM data available for metals and radionuclides in most areas; data lacking for organic chemicals except pesticides and PCBs	Data not replaced unless site-specific data on uptake ratios are available from nearby areas	See above remarks for TAs
PCOC content of vegetation tissues for estimating exposure of herbivores	Vegetation data available for metals and radionuclides in most areas; data lacking for organic chemicals except pesticides and PCBs near ponds	Uptake of organic chemicals estimated using method of Travis and Arms (1988); uptake of metals or radionuclides not estimated unless site-specific uptake ratios available	This decision reflects informal agreement with EPA. Most organics are not taken up extensively. Potentially toxic chemical not represented in tissue will be considered case-by-case
Bioavailability of metals and radionuclides in soils, sediments, and biota	No data were available for estimating bioavailability of specific chemicals in environmental media	Bioavailability was assumed to be 100 percent for all PCOCs in all media	This assumption probably overestimates exposures
Aquatic Systems			
PCOC content of aquatic invertebrate and/or fish tissues	Data may be lacking due to absence of large species (crayfish) or fish from specific areas; data on metals, radionuclides, and PCBs are available where sampling was successful	Data were replaced by estimating PCOC uptake from data on bioconcentration factors (BCF) for specific compounds. Empirically determined BCFs were used when available; K_{ow} was used to estimate bioconcentration when BCFs were not available	Uptake estimates were calculated even for areas that do no currently support diverse aquatic fauna. This may overestimate exposures because receptors would probably not forage in areas lacking prey
Chironomus sp sediment toxicity testing results	Due to laboratory error, toxicity testing was not conducted for some sites. Data on <i>Hyalella azteca</i> is available from all sites tested	Data were not replaced	Laboratory test population was lost prior to testing for some sites. Benthic community data are available for most ponds. Presence or absence of chironomid species may be used as rough indicator

Data Category	Specific Data Gap	Replacement Method	Remarks
General	Adequate TRVs not available for some chemical/species combinations	Data not replaced. Chemicals listed and considered on case-by-case basis.	Chemicals identified on tables listing PCOCs not included in HI calculations.

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Preble's Meadow Jumping Mouse

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
METALS						
ALUMINUM	2.24	White-footed mouse	2.14	Ondreicka et al. 1966 ¹	95.89	95.89
ANTIMONY	0.14	White-footed mouse	0.14	Schroeder et al. 1968 ¹	0.14	0.14
ARSENIC	0.15	White-footed mouse	0.14	Schroeder and Mitchner 1971 ¹	0.63	0.63
BARIUM	14.22	White-footed mouse	13.54	Perry et al. 1983 ¹	11.20	14.22
BERYLLIUM	1.73	White-footed mouse	1.65	Schroeder and Mitchner 1971 ¹	0.01	1.73
CADMIUM	0.22	White-footed mouse	0.21	Schroeder and Mitchner 1971 ¹	0.45	0.45
CHROMIUM ³	7161.75	White-footed mouse	6820.52	Ivankovic and Preussmann 1975 ¹	0.37	7161.75
COBALT	13.19	Rat	5.00	ATSDR, TP-90/10	3.00	13.19
COPPER	43.33	White-footed mouse	41.26	Aulerich et al. 1982 ¹	6.23	43.33
LEAD	20.93	White-footed mouse	19.94	Azar et al. 1973 ¹	0.56	20.93
LITHIUM	24.57	White-footed mouse	23.40	Marathe and Thomas 1986 ¹	0.05	24.57
MAGNESIUM	NA				244.23	244.23
MANGANESE	230.26	White-footed mouse	219.29	Laskey et al. 1982 ¹	17.08	230.26
MERCURY	0.02	White-footed mouse	0.02	Knoffach et al. 1986 ¹	0.01	0.02
MOLYBDENUM	0.29	Mouse	0.25	Schroeder et al. 1971 ²	11.55	11.55
NICKEL	104.67	White-footed mouse	99.68	Ambrose et al. 1976 ¹	1.01	104.67
SELENIUM	0.09	White-footed mouse	0.08	Schroeder and Mitchner 1971 ¹	0.29	0.29
SILVER	58.63	Rat	22.22	USDHHS, ATSDR 1990 ²	0.68	58.63
STRONTIUM	688.18	White-footed mouse	655.39	Skoryna 1981 ¹	6.53	688.18
THALLIUM	0.02	Rat	0.01	Formigli et al. 1986 ¹	0.60	0.60
TIN	65.96	Rat	25.00	USFWS 1989	8.96	65.96
VANADIUM	0.50	White-footed mouse	0.47	Domingo et al. 1986 ¹	2.07	2.07
ZINC	418.66	White-footed mouse	398.72	Schlicker and Cox 1968 ¹	12.02	418.66
PESTICIDES/PCBs						
4,4'-DDT	2.09	White-footed mouse	1.99	Fitzhugh 1948 ¹	2.09	2.09
ALDRIN	0.52	White-footed mouse	0.50	Treon and Cleveland 1955 ¹	0.52	0.52
AROCLOR-1248	0.14	Preble's meadow jumping mouse	0.14	Linzey 1987 ¹	0.14	0.14
AROCLOR-1254	0.14	White-footed mouse	0.14	Linzey 1987 ¹	0.14	0.14
AROCLOR-1260 ⁴	0.14	White-footed mouse	0.14	Linzey 1987 ¹	0.14	0.14

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Preble's Meadow Jumping Mouse

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.05	Rat	0.02	Treon and Cleveland 1955 ¹		0.05
ENDOSULFAN SULFATE	0.91	Rat	0.35	Gupta et al. 1978 ¹		0.91
ENDRIN KETONE	0.06	Rat	0.02	Kavlock et al. 1981 ²		0.06
HEPTACHLOR	2.09	White-footed mouse	1.99	Eisler 1968 ¹		2.09
HEPTACHLOR EPOXIDE	0.66	Rat	0.25	IRIS		0.66
METHOXYCHLOR	10.55	Rat	4.00	Gray et al. 1988 ¹		10.55
delta-BHC ³	4.19	White-footed mouse	3.99	Grant et al. 1977 ¹		4.19
gamma-BHC (LINDANE)	0.87	Rat	0.33	Palmer et al. 1978 ¹		0.87
SEMIVOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	39.05	Rat	14.80	IRIS 1994		39.05
2,4-DIMETHYLPHENOL	58.21	Mouse	50.00	HEAST 1994		58.21
2-METHYLNAPHTHALENE	1163.43	White-footed mouse	1108.00	McKenzie and Angevine 1981 ¹		1163.43
4-METHYLPHENOL	583.77	Rabbit	100.00	USDHHS, TP-91/11		583.77
ACENAPHTHENE	203.75	Mouse	175.00	IRIS		203.75
ACENAPHTHYLENE	NA				NA	
ANTHRACENE	1164.28	Mouse	1000.00	IRIS		1164.28
BENZO(a)ANTHRACENE	11.63	White-footed mouse	11.08	McKenzie and Angevine 1981 ¹		11.63
BENZO(a)PYRENE	1.16	White-footed mouse	1.11	McKenzie and Angevine 1981 ¹		1.16
BENZO(b)FLUORANTHENE	11.63	White-footed mouse	11.08	McKenzie and Angevine 1981 ¹		11.63
BENZO(ghi)PERYLENE	116.34	White-footed mouse	110.80	McKenzie and Angevine 1981 ¹		116.34
BENZO(k)FLUORANTHENE	11.63	White-footed mouse	11.08	McKenzie and Angevine 1981 ¹		11.63
BENZOIC ACID	NA				NA	
BENZYL ALCOHOL	27.31	Dog	3.13	IRIS		27.31
BIS(2-CHLORoisOPROPYL)ETHER	41.68	Mouse	35.80	HEAST		41.68
BIS(2-ETHYLHEXYL)PHTHALATE	21.32	Mouse	20.30	Lamb et al. 1987		21.32
BUTYL BENZYL PHTHALATE	93.35	Rat	35.38	IARC Monographs		93.35
CHRYSENE	116.34	White-footed mouse	110.80	McKenzie and Angevine 1981 ¹		116.34
Di-n-BUTYL PHTHALATE	329.81	Rat	125.00	IRIS		329.81
Di-n-OCTYL PHTHALATE	1217.65	Rat	461.54	Peakell 1975 ²		1217.65
DIBENZO(a,h)ANTHRACENE	1.16	White-footed mouse	1.11	McKenzie and Angevine 1981 ¹		1.16

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Preble's Meadow Jumping Mouse

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA					NA
DIETHYL PHthalATE	409.96	Rat	155.38	Peakell 1980 ²		409.96
FLUORANTHENE	145.53	Mouse	125.00	IRIS		145.53
FLUORENE	145.53	Mouse	125.00	IRIS		145.53
INDENO(1,2,3-cd)PYRENE	11.63	White-footed mouse	11.08	Mckenzie and Angevine 1981 ¹		11.63
ISOPHORONE	1308.68	Dog	150.00	IRIS		
NAPHTHALENE	1163.43	White-footed mouse	110.80	Mckenzie and Angevine 1981 ¹		1308.68
PENTACHLOROPHENOL	7.92	Rat	3.00	IRIS		1163.43
PHENANTHRENE	1163.43	White-footed mouse	1108.00	Mckenzie and Angevine 1981 ¹		7.92
PHENOL	158.31	Rat	60.00	IRIS		1163.43
PYRENE	87.32	Mouse	75.00	IRIS		158.31
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	1223.29	White-footed mouse	1165.00	Lane et al. 1982 ¹		1223.29
1,1-DICHLOROETHANE	263.85	Rat	100.00	HEAST		263.85
1,1-DICHLOROETHENE	79.15	Rat	30.00	Quast et al. 1983 ¹		79.15
1,2-DICHLOROETHANE	61.19	Mouse	58.28	Lane et al. 1982 ¹		61.19
1,2-DICHLOROETHENE	52.63	Mouse	45.20	Palmer et al. 1979 ¹		52.63
2-BUTANONE	4672.70	Rat	1771.00	IRIS		4672.70
2-HEXANONE	NA					
4-METHYL-2-PENTANONE	65.42	White-footed mouse	62.30	Microbial Associates 1986 ¹		65.42
ACETONE	26.17	White-footed mouse	24.92	EPA 1986		26.17
BENZENE	30.66	White-footed mouse	29.20	Nawrot and Staples 1979 ¹		30.66
CARBON DISULFIDE	29.02	Rat	11.00	IRIS		29.02
CHLOROETHANE	NA					
CHLOROFORM	39.25	White-footed mouse	37.38	Palmer et al. 1979 ¹		NA
CHLOROMETHANE	NA					39.25
ETHYLBENZENE	358.83	Rat	136.00	IRIS		358.83
METHYLENE CHLORIDE	15.31	White-footed mouse	14.58	NCA 1982 ¹		15.31
TETRACHLOROETHENE	16.30	Mouse	14.00	IRIS		16.30
TOLUENE	30.22	White-footed mouse	28.78	Nawrot and Staples 1979 ¹		30.22

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETs
Preble's Meadow Jumping Mouse

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLEMES	2.40	White-footed mouse	2.28	Marks et al. 1982 ¹		2.40
TRICHLOROETHENE	171.04	Mouse	146.91	Weissman 1981 ²		171.04
VINYL ACETATE	263.85	Rat	100.00	HEAST		263.85
VINYL CHLORIDE	0.45	Rat	0.17	Feron et al. 1981 ¹		0.45
O-XYLENE	NA					
WATER QUALITY PARAMETERS						
NITRATE/NITRITE ⁶	34.67	Rat	13.14	Shuval et al. 1972 ²		34.67
NITRITE	NA					

¹ Based on values used in ORNL 1994.

² Based on values researched by Clemson University.

³ NOAEL for Chromium +3.

⁴ Same as for Aroclor-1254.

⁵ Mixed isomers for delta-BHC.

⁶ Values are for nitrite.

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
American Kestrel

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
METALS						
ALUMINUM	122.69	Ringed dove	111.40	Carriere et al. 1986 ¹	147.66	147.66
ANTIMONY	NA	Brown-headed cowbird	2.46	USFWS 1969 ¹	0.05	NA
ARSENIC	1.85	Chicken	20.86	Johnson et al. 1960 ¹	4.46	1.85
BARIUM	21.16					21.16
BERYLLIUM	NA					0.02
CADMIUM	3.12	Mallard	1.45	White and Finley 1978 ¹	0.76	3.12
CHROMIUM	2.21	Black duck	1.00	Haseltine et al. ¹	2.17	2.21
COBALT	0.04	Chicken	0.02	Galanis and Altbhai 1990 ²	0.08	0.08
COPPER	33.68	Chicken	33.21	Mehring et al. 1960 ¹	6.50	33.68
LEAD	3.85	American kestrel	3.85	Pattee 1984 ¹	0.93	3.85
LITHIUM	NA					0.10
MAGNESIUM	NA					0.10
MANGANESE	21.09	Turkey poults	32.36	Vohra and Kratzer 1968 ²	7.43	234.76
MERCURY	0.01	Mallard	0.01	Heinz 1979 ¹	0.01	21.09
MOLYBDENUM	2.50	Chicken	2.38	Kratzer 1958 ²	0.14	2.50
NICKEL	146.12	Mallard duckling	77.40	Cain and Pafford 1981 ¹	6.14	146.12
SELENIUM	0.82	Mallard	0.40	Heinz et al. 1987 ¹	0.76	0.82
SILVER	2304.90	Turkey	165.61	Jensen, Peterson, Faien 1974 ²	2304.90	
STRONTIUM	14.15	Chicken four weeks	8.28	Weber et al. 1968 ²	4.92	14.15
THALLIUM	NA					0.01
TIN	NA					0.01
VANADIUM	0.62	Coturnix	0.67	Hill and Camardese 1986 ²	0.28	0.62
ZINC	6.45	Mallard	3.00	' Gasaway and Buss 1972 ¹	32.10	32.10
PESTICIDES/PCBs						
4,4'-DDT	8.34E-04	Red-tailed hawk	4.10E-04	Anderson et al. 1975 ¹		8.34E-04
ALDRIN ³	0.12	Barn owl	0.08	Mendenhall et al. 1983 ¹		0.12
AROCLOR-1248	NA					NA
AROCLOR-1254	0.36	Red-tailed hawk	0.17	Dahlgren et al. 1972 ¹		0.36
AROCLOR-1260	0.36	Red-tailed hawk	0.17	Dahlgren et al. 1972 ¹		0.36

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
American Kestrel

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.12	Barn-owl	0.08	Mendenhall et al. 1983 ¹	0.12	NA
ENDOSULFAN SULFATE	NA				NA	NA
ENDRIN KETONE	NA				NA	NA
HEPTACHLOR	0.07	Coturnix	0.07	Hill and Camardese 1986 ²	0.07	0.07
HEPTACHLOR EPOXIDE	0.01	Woodcock	0.01	No author listed	0.01	0.01
METHOXYCHLOR	NA				NA	NA
delta-BHC	0.60	Red-tailed hawk	1.92	Chakravarty and Lahiri 1986 ¹	0.60	0.60
gamma-BHC (INDANE)	4.01	Red-tailed hawk	1.92	Chakravarty and Lahiri 1986 ¹	4.01	4.01
SEMI-VOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	NA				NA	NA
2,4-DIMETHYLPHENOL	NA				NA	NA
2-METHYLNAPHTHALENE	77.63	Chicken	33.10	Brunstrom et al. 1990 ²	77.63	77.63
4-METHYLPHENOL	NA				NA	NA
ACENAPHTHENE	77.63	Chicken	33.10	Brunstrom et al. 1990 ²	77.63	77.63
ACENAPHTHYLENE	NA				NA	NA
ANTHRACENE	0.08	Chicken	0.33	Brunstrom et al. 1990 ²	0.08	0.08
BENZO(a)ANTHRACENE	0.78	Chicken	0.33	Brunstrom et al. 1990 ²	0.78	0.78
BENZO(a)PYRENE	0.08	Chicken	0.03	Brunstrom et al. 1990 ²	0.08	0.08
BENZO(b)FLUORANTHENE	0.77	Chicken	0.33	Brunstrom et al. 1990 ²	0.77	0.77
BENZO(ghi)PERYLENE	0.78	Chicken	0.33	Brunstrom et al. 1990 ²	0.78	0.78
BENZO(k)FLUORANTHENE	0.08	Chicken	0.03	Brunstrom et al. 1990 ²	0.08	0.08
BENZOIC ACID	NA				NA	NA
BENZYL ALCOHOL	NA				NA	NA
BIS(2-CHLOROISOPROPYL)ETHER	NA				NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	1.20	Red-tailed Hawk	0.58	Peakall 1974 ¹	1.20	1.20
BUTYL BENZYL PHTHALATE	226.54	Chicken embryo	96.60	Bower et al. 1970 ²	226.54	226.54
CHRYSENE	0.78	Chicken	0.33	Brunstrom et al. 1990 ²	0.78	0.78
Di-n-BUTYL PHTHALATE	0.12	Red-tailed Hawk	0.06	Peakall 1974 ¹	0.12	0.12
Di-n-OCTYL PHTHALATE	98.97	Chicken	0.03	Brunstrom et al. 1990 ²	98.97	98.97
DIBENZO(a,h)ANTHRACENE	0.08	Chicken	0.03	Brunstrom et al. 1990 ²	0.08	0.08

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Coyote

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA					NA
DIETHYL PHTHALATE	620.06	Red fox	877.10	Lamb et al. 1987 ²		620.06
FLUORANTHENE	16.66	Mouse	125.00	IRIS		16.66
FLUORENE	16.66	Mouse	125.00	IRIS		16.66
INDENO(1,2,3-cd)PYRENE	1.35	Red fox	1.91	McKenzie and Angevine 1981 ¹		1.35
ISOPHORONE	149.80	Dog	150.00	IRIS		149.80
NAPHTHALENE	135.03	Red fox	191.00	McKenzie and Angevine 1981 ¹		135.03
PENTACHLOROPHENOL	0.91	Rat	3.00	IRIS		0.91
PHENANTHRENE	135.03	Red fox	191.00	McKenzie and Angevine 1981 ¹		135.03
PHENOL	18.12	Rat	60.00	IRIS		18.12
PYRENE	10.00	Mouse	75.00	IRIS		10.00
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	142.35	Red fox	201.36	Lane et al. 1982 ¹		142.35
1,1-DICHLOROETHANE	30.20	Rat	100.00	HEAST		30.20
1,1-DICHLOROETHENE	2.50	Dog	2.50	Quast et al. 1983 ¹		2.50
1,2-DICHLOROETHANE	7.12	Red fox	10.07	Lane et al. 1982 ¹		7.12
1,2-DICHLOROETHENE	6.02	Mouse	45.20	Palmer et al. 1979 ¹		6.02
2-BUTANONE	534.88	Rat	1771.00	IRIS		534.88
2-HEXANONE	NA					
4-METHYL-2-PENTANONE	7.61	Red fox	10.76	Microbial Associates 1986 ¹		7.61
ACETONE	3.04	Red fox	4.31	EPA 1986		3.04
BENZENE	3.57	Red fox	5.05	Nawrot and Staples 1979 ¹		3.57
CARBON DISULFIDE	3.32	Rat	11.00	IRIS		3.32
CHLOROETHANE	NA					
CHLOROFORM	4.57	Red fox	6.46	Palmer et al. 1979 ¹	101.00	NA
CHLOROMETHANE	NA					4.57
ETHYLBENZENE	41.08	Rat	136.00	IRIS		41.08
METHYLENE CHLORIDE	1.78	Red fox	2.52	NCA 1982 ¹		1.78
TETRACHLOROETHENE	1.87	Mouse	14.00	IRIS		0.59
TOLUENE	3.51	Red fox	4.97	Nawrot and Staples 1979 ¹	0.40	3.51

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 Toxicity Reference Values (TRVs) Used in Estimating Risks
 to Wildlife Receptors from Exposure to PCOCs at RFETS
 Coyote

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLENES	0.28	Red fox	0.39	Marks et al. 1982 ¹	3.28	0.28
TRICHLOROETHENE	19.58	Mouse	146.91	Weissman 1980 ²	8.82	19.58
VINYL ACETATE	30.20	Rat	100.00	HEAST	0.70	30.20
VINYL CHLORIDE	0.05	Rat	0.17	Feron et al. 1981 ¹	0.05	0.05
O-XYLENE	NA					
WATER QUALITY PARAMETERS						
NITRATE/NITRITE ⁶	3.97	Rat	13.14	Shuval et al. 1972 ²	1.10	3.97
NITRITE	NA					

¹Based on values used in ORNL 1994.

²Based on values researched by Clemson University.

³NOAEL for Chromium +3.

⁴Same as for Aroclor-1254.

⁵Mixed isomers for delta-BHC.

⁶Values are for nitrite.

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Red-tailed Hawk

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.06	Barn-owl	0.08	Mendenhall et al. 1983 ¹		0.06
ENDOSULFAN SULFATE	NA					NA
ENDRIN KETONE	NA					NA
HEPTACHLOR	0.03	Cortunix	0.07	Hill and Camardese 1986 ²		0.03
HEPTACHLOR EPOXIDE	3.7E-3	Woodcock	0.01	No author listed		3.68E-03
METHOXYCHLOR	NA					
delta-BHC	0.29	Red-tailed hawk	0.29	Vos et al. 1971 ¹		0.29
gamma-BHC (LINDANE)	1.92	Red-tailed hawk	1.92	Chakravarty and Lahiri 1986 ¹		1.92
SEMIVOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	NA					NA
2,4-DIMETHYLPHENOL	NA					NA
2-METHYLNAPHTHALENE	37.22	Chicken	33.10	Brunstrom et al. 1990 ²		37.22
4-METHYLPHENOL	NA					
ACENAPHTHENE	37.22	Chicken	33.10	Brunstrom et al. 1990 ²		37.22
ACENAPHTHYLENE	NA					
ANTHRACENE	0.04	Chicken	0.33	Brunstrom et al. 1990 ²		NA
BENZO(a)ANTHRACENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.04
BENZO(a)PYRENE	0.04	Chicken	0.03	Brunstrom et al. 1990 ²		0.37
BENZO(b)FLUORANTHENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.04
BENZO(ghi)PERYLENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.37
BENZO(k)FLUORANTHENE	0.04	Chicken	0.03	Brunstrom et al. 1990 ²		0.37
BENZOIC ACID	NA					0.04
BENZYL ALCOHOL	NA					NA
BIS(2-CHLOROISOPROPYL)ETHER	NA					NA
BIS(2-ETHYLHEXYL)PHTHALATE	0.58	Red-tailed hawk	0.577	Peakall 1974 ¹		0.58
BUTYL BENZYL PHTHALATE	108.61	Chicken embryo	96.60	Bower et al. 1970 ²		108.61
CHRYSENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.37
DI-n-BUTYL PHTHALATE	0.06	Red-tailed hawk	0.58	Peakall 1974 ¹ -		0.06
DI-n-OCTYL PHTHALATE	47.45	Chicken	42.24	Bower et al. 1970 ²		47.45
DIBENZO(a,h)ANTHRACENE ⁴	0.04	Chicken	0.03	Brunstrom et al. 1990 ²		0.04

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**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**
Red-tailed Hawk

PCOC	NOAEL (mg/kg/day)	Reference Species NOAEL	Reference Species (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA					NA
DIETHYL PHTHALATE	59.70					59.70
FLUORANTHENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.37
FLUORENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		0.37
INDENO(1,2,3-cd)PYRENE	0.09	Chicken	0.83	Brunstrom et al. 1990 ²		0.37
ISOPHORONE	NA					0.09
NAPHTHALENE	37.22	Chicken	33.10	Brunstrom et al. 1990 ²		NA
PENTACHLOROPHENOL	8.84	Mallard	16.92	Nebeker et al. 1994 ²		37.22
PHENANTHRENE	0.04	Chicken	0.03	Brunstrom et al. 1990 ²		8.84
PHENOL	19.88	Agelaius phoeniceus	50.30	Schafer et al. 1983 ²		0.04
PYRENE	0.37	Chicken	0.33	Brunstrom et al. 1990 ²		19.88
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	1.29	Chicken	1.15	Elovaara et al. 1979 ²		0.37
1,1-DICHLOROETHANE	NA					1.29
1,1-DICHLOROETHENE	NA					NA
1,2-DICHLOROETHANE	19.31	Red-tailed hawk	19.31	Alumot et al. 1976 ¹		NA
1,2-DICHLOROETHENE	NA					19.31
2-BUTANONE	NA					NA
2-HEXANONE	NA					NA
4-METHYL-2-PENTANONE	NA					NA
ACETONE	87.70	Chicken	78.00	McLaughlin et al. 1965 ²		87.70
BENZENE	8.54	Chicken	7.60	McLaughlin et al. 1965 ²		8.54
CARBON DISULFIDE	NA					NA
CHLOROETHANE	NA					NA
CHLOROFORM	NA					NA
CHLOROMETHANE	NA					NA
ETHYLBENZENE	NA					NA
METHYLENE CHLORIDE	0.82	Chicken	0.73	Elovaara et al. 1979 ²		NA
TETRACHLOROETHENE	1.61	Chicken	1.43	Elovaara et al. 1979 ²		0.82
TOLUENE	4.46	Chicken	3.97	Elovaara et al. 1979 ²		1.61
						4.46

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Red-tailed Hawk

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLENES	117.63	Coturnix	267.00	Hill and Camardese 1986 ²		
TRICHLOROETHENE	1.27	Chicken	1.13	Elovaara et al. 1979 ²	117.63	
VINYL ACETATE	NA					
VINYL CHLORIDE	NA					
O-XYLENE	NA					
WATER QUALITY PARAMETERS						
NITRITE	NA					
NITRATE/NITRITE	0.96	Chicken	1.53	Adams et al. 1966 ²	NA	0.96

¹Based on values used in ORNL 1994.

²Based on values researched by Clemson University.

³Dieldrin values are used for Aldrin.

⁴Dibenz(a,h)anthracene values are extrapolated from Benzo(a)pyrene.

**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**
Mule Deer

METALS	PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake	TRV
						(mg/kg)	(mg/kg)
ALUMINUM		0.15	White-tailed deer	0.16	Ondreicka et al. 1966 ¹	13.14	13.14
ANTIMONY		0.01	White-tailed deer	0.01	Schroeder et al. 1968 ¹		0.01
ARSENIC		0.01	White-tailed deer	0.01	Schroeder and Mitchner 1971 ¹	0.11	0.11
BARIUM		0.95	White-tailed deer	1.02	Perry et al. 1983 ¹	2.00	2.00
BERYLLIUM		0.11	White-tailed deer	0.12	Schroeder and Mitchner 1975 ¹	8.00E-04	0.11
CADMIUM		0.01	White-tailed deer	0.02	Schroeder and Mitchner 1971 ¹	0.05	0.05
CHROMIUM ³		476.07	White-tailed deer	511.27	Ivankovic and Preussmann 1975 ¹	0.06	476.07
COBALT		0.86	Rat	5.00	ATSDR, TP-91/10	0.55	0.86
COPPER		2.88	White-tailed deer	3.09	Aulerich et al. 1982 ¹	0.37	2.88
LEAD		1.39	White-tailed deer	1.49	Azar et al. 1973 ¹	0.05	1.39
LITHIUM		1.63	White-tailed deer	1.75	Marathe and Thomas 1986 ¹	0.01	1.63
MAGNESIUM		NA					
MANGANESE		15.31	White-tailed deer	16.44	Laskey et al. 1982 ¹	44.06	44.06
MERCURY		9.31E-04	White-tailed deer	1.00E-03	Knollach et al. 1986 ¹	2.97	15.31
MOLYBDENUM		11.11	Sheep	11.80		2.40E-03	2.40E-03
NICKEL		6.96	White-tailed deer	7.47	Ambrose et al. 1976 ¹	2.13	11.11
SELENIUM		0.01	White-tailed deer	0.01	Schroeder and Mitchner 1971 ¹	0.18	6.96
SILVER		3.81	Rat	22.22	USDHHS, ATSDR 1990 ²	0.13	3.81
STRONTIUM		45.74	White-tailed deer	49.13	Skoryna 1981 ¹	1.19	45.74
THALLIUM		0.00	Rat	0.01	Formigli et al. 1986 ¹	0.11	0.11
TIN		4.28	Rat	25.00	USFWS 1989	1.64	4.28
VANADIUM		0.03	White-tailed deer	0.04	Domingo et al. 1986 ¹	0.37	0.37
ZINC		27.83	White-tailed deer	68.88	Schlicker and Cox 1968 ¹	0.79	27.83
PESTICIDES/PCBs							
4,4'-DDT		0.14	White-tailed deer	0.15	Fitzhugh 1948 ¹		
ALDRIN*		0.03	White-tailed deer	0.04	Treon and Cleveland 1955 ¹		0.14
ACROCLOR-1248		0.01	Mule deer	0.01	Linzey 1987 ¹		0.03
ACROCLOR-1254		0.01	Red-tailed hawk	0.01	Linzey 1987 ¹		0.01
ACROCLOR-1260 ⁴		0.01	Red-tailed hawk	0.01	Linzey 1987 ¹		0.01

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETs
Mule Deer

PCOC	NOAEL (mg/kg/day)	Reference Species NOAEL (mg/kg/day)	Reference Species (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.00	Rat	0.02	Treon and Cleveland 1955 ¹	3.43E-03	
ENDOSULFAN SULFATE	0.06	Rat	0.35	Gupta et al. 1978 ¹	0.06	
ENDRIN KETONE	0.00	Rat	0.02	Kavlock et al. 1981 ²	3.94E-03	
HEPTACHLOR	0.14	White-tailed deer	0.15	Eisler 1968 ¹	0.14	
HEPTACHLOR EPoxide	0.07	Dog	0.25	IRIS	0.07	
METHOXYCHLOR	0.69	Rat	4.00	Gray et al. 1988 ¹	0.69	
delta-BHC ³	0.28	White-tailed deer	0.30	Grant et al. 1977 ¹	0.28	
gamma-BHC (LINDANE)	1.39	White-tailed deer	1.49	Palmer et al. 1978 ¹	1.39	
SEMIVOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	2.54	Rat	14.80	IRIS	0.00	
2,4-DIMETHYLPHENOL	3.78	Mouse	50.00	HEAST 1994	2.54	
2-METHYLNAPHTHALENE	77.28	White-tailed deer	0.08	McKenzie and Angevine 1981 ¹	3.78	
4-METHYLPHENOL	37.90	Rabbit	160.00	USDHHS, TP-91/11	77.28	
ACENAPHTHENE	13.23	Mouse	175.00	IRIS	37.90	
ACENAPHTHYLENE	NA				13.23	
ANTHRACENE	75.59	Mouse	1000.00	IRIS	NA	
BENZO(a)ANTHRACENE	0.77	White-tailed deer	0.80	McKenzie and Angevine 1981 ¹	75.59	
BENZO(a)PYRENE	0.08	White-tailed deer	0.08	McKenzie and Angevine 1981 ¹	0.77	
BENZO(b)FLUORANTHENE	0.77	White-tailed deer	0.80	McKenzie and Angevine 1981 ¹	0.08	
BENZO(gh)PERYLENE	7.73	White-tailed deer	8.00	McKenzie and Angevine 1981 ¹	0.77	
BENZO(k)FLUORANTHENE	0.77	White-tailed deer	0.80	McKenzie and Angevine 1981 ¹	7.73	
BENZOIC ACID	NA				0.77	
BENZYL ALCOHOL	1.77	Dog	3.13	IRIS	NA	
BIS(2-CHLOROISOPROPYL)ETHER	2.71	Mouse	35.80	HEAST 1994	1.77	
BIS(2-ETHYLHEXYL)PHTHALATE	1.42	White-tailed deer	1.52	Lamb et al. 1987	2.71	
BUTYL BENZYL PHTHALATE	6.06	Rat	35.38	IARC Monographs	1.42	
CHRYSENE	7.73	White-tailed deer	8.00	McKenzie and Angevine 1981 ¹	6.06	
DI-n-BUTYL PHTHALATE	42.53	White-tailed deer	45.67	Lamb et al. 1987	7.73	
DI-n-OCTYL PHTHALATE	79.05	Rat	461.54	Peakall 1975 ²	42.53	
DIBENZO(a,h)ANTHRACENE	0.08	White-tailed deer	0.08	McKenzie and Angevine 1981 ¹	79.05	
					0.08	

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Mule Deer

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA					NA
DIETHYL PHTHALATE	354.37	White-tailed deer	380.57	Lamb et al. 1987 ²		
FLUORANTHENE	9.45	Mouse	125.00	IRIS		354.37
FLUORENE	9.45	Mouse	125.00	IRIS		9.45
INDENO(1,2,3-cd)PYRENE	0.77	White-tailed deer	0.80	McKenzie and Angevine 1981 ¹		9.45
ISOPHORONE	84.97	Dog	150.00	IRIS		0.77
NAPHTHALENE	77.28	White-tailed deer	83.00	McKenzie and Angevine 1981 ¹		84.97
PENTACHLOROPHENOL	0.51	Rat	3.00	IRIS		77.28
PHENANTHRENE	77.28	White-tailed deer	83.00	McKenzie and Angevine 1981 ¹		0.51
PHENOL	10.28	Rat	60.00	IRIS		77.28
PYRENE	5.67	Mouse	75.00	IRIS		10.28
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	81.35	White-tailed deer	87.37	Lane et al 1982 ¹		5.67
1,1-DICHLOROETHANE	17.13	Rat	100.00	HEAST		81.35
1,1-DICHLOROETHENE	1.42	Dog	2.50	Quast et al. 1983 ¹		17.13
1,2-DICHLOROETHANE	4.07	White-tailed deer	4.37	Lane et al. 1982 ¹		1.42
1,2-DICHLOROETHENE	3.42	Mouse	45.20	Palmer et al. 1979 ¹		4.07
2-BUTANONE	303.37	Rat	1771.00	IRIS		3.42
2-HEXANONE	NA					
4-METHYL-2-PENTANONE	4.35	White-tailed deer	4.67	Microbial Associates 1986 ¹		303.37
ACETONE	1.74	White-tailed deer	1.87	EPA 1986		4.35
BENZENE	2.04	White-tailed deer	2.19	Nawrot and Staples 1979 ¹		1.74
CARBON DISULFIDE	1.88	Rat	11.00	IRIS		2.04
CHLOROETHANE	NA					
CHLOROFORM	2.61	White-tailed deer	2.80	Palmer et al. 1979 ¹		1.88
CHLOROMETHANE	NA					
ETHYLBENZENE	23.30	Rat	136.00	Palmer et al. 1979 ¹		2.61
METHYLENE CHLORIDE	1.02	White-tailed deer	1.09	IRIS		NA
TETRACHLOROETHENE	1.06	Mouse	14.00	NCA 1982 ¹		23.30
TOLUENE	2.01	White-tailed deer	2.16	IRIS		1.02
				Nawrot and Staples 1979 ¹		1.06
						2.01

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Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Mule Deer

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLEMES	0.16	White-tailed deer	0.17	Marks et al. 1982 ¹		
TRICHLOROETHENE	11.10	Mouse	146.91	Weissman 1980 ²	0.16	
VINYL ACETATE	17.13	Rat	100.00	HEAST	11.10	
VINYL CHLORIDE	0.03	Rat	0.17	Feron et al. 1981	17.13	
O-XYLENE	NA				0.03	
WATER QUALITY PARAMETERS						
NITRATE/NITRITE ⁶	2.25	Rat	13.14	Shuvai et al. 1972 ²		
NITRITE	NA			NA	NA	
					2.25	

¹Based on values used in ORNL 1994.

²Based on values researched by Clemson University.

³NOAEL for Chromium +3.

⁴Same as for Aroclor-1254.

⁵Mixed isomers for delta-BHC.

⁶Values are for nitrite.

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS

Great Blue Heron

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METALS	PCOC	NOAEL (mg/kg/day)	Reference Species	(mg/kg/day)	Source	Background	TRV (mg/kg)
						Intake (mg/kg)	
ALUMINUM		45.85	Ringed dove	111.40	Carriere et al. 1986 ¹	29.94	45.85
ANTIMONY		NA					
ARSENIC		0.69	Brown-headed cowbird	2.46	USFWS 1969 ¹	0.13	0.13
BARIUM		7.91	Chicken	20.86	Johnson et al. 1960 ¹	0.03	0.69
BERYLLIUM		NA				0.63	7.91
CADMUM		1.16	Mallard	1.45	White and Finley 1978 ¹	0.02	0.02
CHROMIUM		0.82	Black duck	1.00	Haseltine et al. ¹	0.01	1.16
COBALT		0.02	Chicken	0.02	Galan and Alibhai 1990 ²	1.55	1.55
COPPER		12.59	Chicken	33.21	Mehring et al. 1960 ¹	0.11	0.11
LEAD		1.44	American kestrel	3.85	Pattiee 1984 ¹	9.93	12.59
LITHIUM		NA				1.07	1.44
MAGNESIUM		NA				0.21	0.21
MANGANESE		23.17	Turkey poult	32.36	Vohra and Kratzer 1968 ²	11.21	11.21
MERCURY		0.01	Mallard	0.01	Heinz 1979 ¹	1.00	23.17
MOLYBDENUM		0.93	Chicken	2.38	Kratzer 1958 ²	0.20	0.93
NICKEL		54.61	Mallard duckling	77.40	Cain and Pafford 1981 ¹	0.26	54.61
SELENIUM		0.31	Mallard	0.40	Heinz et al. 1987 ¹	0.01	0.31
SILVER		861.38	Turkey	165.61	Jensen, Peterson, Falen 1974 ²	0.03	861.38
STRONTIUM		5.29	Chicken four weeks	8.28	Weber et al. 1968 ²	1.44	5.29
THALLIUM		NA				0.05	0.05
TIN		NA				15.42	15.42
VANADIUM		0.23	Coturnix	0.67	Hill and Camardese 1986 ²	0.16	0.23
ZINC		2.41	Mallard	3.00	Gasaway and Buss 1972 ¹	138.68	138.68
PESTICIDES/PCBS							
4,4'-DDT		3.20E-04	Great blue heron	3.20E-04	Anderson et al. 1975 ¹		
ALDRIN ³		0.05	Barn owl	0.08	Mendenhall et al. 1983 ¹		3.20E-04
AROCLOR-1248		NA				0.05	
AROCLOR-1254		0.14	Great blue heron	0.14	Dahlgren et al. 1972 ¹	NA	
AROCLOR-1260		0.14	Great blue heron	0.14	Dahlgren et al. 1972 ¹	0.14	

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Great Blue Heron

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.05	Barn owl	0.08	Mendenhall et al. 1983 ¹		0.05
ENDOSULFAN SULFATE	NA					NA
ENDRIN KETONE	NA					NA
HEPTACHLOR	0.03	Coturnix	0.07	Hill and Camardese 1986 ²		NA
HEPTACHLOR EPOXIDE	2.87E-03	Woodcock	0.01	No author listed		0.03
METHOXYCHLOR	NA					2.87E-03
delta-BHC	0.23	Great blue heron	0.23	Vos et al. 1971 ¹		NA
gamma-BHC (LINDANE)	1.50	Great blue heron	1.50	Chakrabarty and Lahiri 1986 ¹		0.23
SEMI-VOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	NA					1.50
2,4-DIMETHYLPHENOL	NA					NA
2-METHYLNAPHTHALENE	29.01	Chicken	33.10	Brunstrom et al. 1990 ²		NA
4-METHYLPHENOL	NA					29.01
ACENAPHTHENE	29.01	Chicken	33.10	Brunstrom et al. 1990 ²		NA
ACENAPHTHYLENE	NA					NA
ANTHRACENE	0.02	Chicken	0.33	Brunstrom et al. 1990 ²		29.01
BENZO(a)ANTHRACENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		NA
BENZO(a)PYRENE	0.03	Chicken	0.03	Brunstrom et al. 1990 ²		0.02
BENZO(b)FLUORANTHENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		0.29
BENZO(ghi)PERYLENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		0.03
BENZO(k)FLUORANTHENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		0.29
BENZOIC ACID	0.03	Chicken	0.03	Brunstrom et al. 1990 ²		0.29
BENZYL ALCOHOL	NA					0.29
BIS(2-CHLOROISOPROPYL)ETHER	NA					0.03
BIS(2-ETHYLHEXYL)PHTHALATE	0.45	Great Blue Heron	0.45	Peakall 1974 ¹		NA
BUTYL BENZYL PHTHALATE	84.66	Chicken embryo	96.60	Bower et al. 1970 ²		NA
CHRYSENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		0.45
Di-n-BUTYL PHTHALATE	0.05	Great Blue Heron	0.05	Peakall 1974 ¹		84.66
Di-n-OCTYL PHTHALATE	36.99	Chicken	0.03	Brunstrom et al. 1990 ²		0.29
DIBENZO(a,h)ANTHRACENE ⁴						0.05
						36.99
						0.03

**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**
Great Blue Heron

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA					NA
DIETHYL PHTHALATE	46.54					46.54
FLUORANTHENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²		
FLUORENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²	0.29	
INDENO(1,2,3- α -d)PYRENE	0.07	Chicken	0.83	Brunstrom et al. 1990 ²	0.09	0.29
ISOPHORONE	NA					
NAPHTHALENE	29.01	Chicken	33.10	Brunstrom et al. 1990 ²		0.07
PENTACHLOROPHENOL	6.89	Mallard	16.92	Nebeker et al. 1994 ²		NA
PHENANTHRENE	0.03	Chicken	0.03	Brunstrom et al. 1990 ²	29.01	
PHENOL	15.50	Agelaius phoeniceus	50.30	Schafer et al. 1983 ²	6.89	
PYRENE	0.29	Chicken	0.33	Brunstrom et al. 1990 ²	0.03	
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	1.01	Chicken	1.15	Elovaara et al. 1979 ²		0.29
1,1-DICHLOROETHANE	NA					1.01
1,1-DICHLOROETHENE	NA					NA
1,2-DICHLOROETHANE	15.07	Great blue heron	15.07	Alumot et al. 1976 ¹		NA
1,2-DICHLOROETHENE	NA					15.07
2-BUTANONE	NA					NA
2-HEXANONE	NA					NA
4-METHYL-2-PENTANONE	NA					NA
ACETONE	NA					NA
BENZENE	68.36	Chicken	78.00	McLaughlin et al. 1965 ²		NA
CARBON DISULFIDE	6.66	Chicken	7.60	McLaughlin et al. 1965 ²	68.36	
CHLOROETHANE	NA					6.66
CHLOROFORM	NA					NA
CHLOROMETHANE	NA					NA
ETHYL BENZENE	NA					NA
METHYLENE CHLORIDE	0.64	Chicken	0.73	Elovaara et al. 1979 ²	NA	
TETRACHLOROETHENE	1.25	Chicken	1.43	Elovaara et al. 1979 ²	0.64	
TOLUENE	3.48	Chicken	3.97	Elovaara et al. 1979 ²	1.25	
						3.48

**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**
Great Blue Heron

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLEMES	91.70	Coturnix	267.00	Hill and Camardese 1986 ²		
TRICHLOROETHENE	0.99	Chicken	1.13	Elovaara et al. 1979 ²	91.70	
VINYL ACETATE	NA				0.99	
VINYL CHLORIDE	NA				NA	
O-XYLENE	NA				NA	
WATER QUALITY PARAMETERS						
NITRITE	NA				NA	
NITRATE/NITRITE	0.75	Chicken	1.53	Adams et al. 1966 ²	0.75	

¹Based on values used in ORNL 1994.

²Based on values researched by Clemson University.

³Dieldrin values are used for Aldrin.

⁴Dibenz(a,h)anthracene values are extrapolated from Benzo(a)pyrene.

**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**

Mallard

PCOC METALS	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background	TRV
					Intake (mg/kg)	(mg/kg)
ALUMINUM	57.42	Ringed dove	111.40	Carriere et al. 1986 ¹	16.42	57.42
ANTIMONY	NA					
ARSENIC	5.13	Mallard	5.10	USFWS 1969 ¹	0.13	0.13
BARIUM	9.90	Chicken	20.86	Johnson et al. 1960 ¹	0.09	5.13
BERYLLIUM	NA					
CADMIUM	1.46	Mallard	1.45	White and Finley 1978 ¹	0.01	0.01
CHROMIUM	1.03	Black duck	1.00	Haseltine et al. ¹	0.97	1.46
COBALT	0.02	Chicken	0.02	Galani and Alibhai 1990 ²	0.07	1.03
COPPER	15.76	Chicken	33.21	Mehring et al. 1960 ¹	0.44	0.44
LEAD	1.80	American kestrel	3.85	Pattee 1984 ¹	0.35	15.76
LITHIUM	NA				0.07	1.80
MAGNESIUM					0.23	0.23
MANGANESE	49.51	Turkey poult	32.36	Vohra and Kratzer 1968 ²	33.76	33.76
MERCURY	0.01	Mallard	0.01	Heinz 1979 ¹	2.07	49.51
MOLYBDENUM	1.17	Chicken	2.38	Kratzer 1958 ²	0.02	0.02
NICKEL	68.39	Mallard duckling	77.40	Cain and Pafford 1981 ¹	1.46	1.46
SELENIUM	0.38	Mallard	0.40	Heinz et al. 1987 ¹	0.23	68.39
SILVER	1078.77	Turkey	165.61	Jensen, Peterson, Falen 1974 ²	0.08	0.38
STRONTIUM	6.62	Chicken four weeks	8.28	Weber et al. 1968 ²	0.13	1078.77
THALLIUM	NA				3.10	6.62
TIN	NA				0.10	0.10
VANADIUM	0.29	Coturnix	0.67	Hill and Camardese 1986 ²	4.49	4.49
ZINC	3.02	Mallard	3.00	Gasaway and Buss 1972 ¹	0.34	0.34
PESTICIDES/PCBs						
4,4'-DDT	4.03E-04	American woodcock	7.20E-04	Anderson et al. 1975 ¹	4.03E-04	
ALDRIN ³	0.06	Barn owl	0.08	Mendenhall et al. 1983 ¹	0.06	
AROCLOR-1248	NA				NA	
AROCLOR-1254	C.17	American woodcock	0.31	Dahlgren et al. 1972 ¹	0.17	
AROCLOR-1260	0.17	American woodcock	0.31	Dahlgren et al. 1972 ¹	0.17	

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Mallard

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIELDRIN	0.06	Barn-owl	0.08	Mendenhall et al. 1983	0.06	NA
ENDOSULFAN SULFATE	NA				NA	NA
ENDRIN KETONE	NA				NA	NA
HEPTACHLOR	0.03	Coturnix	0.17	Hill and Camardese 1986 ²	NA	NA
HEPTACHLOR EPOXIDE	3.59E-03	Woodcock	0.01	No author listed	0.03	3.59E-03
METHOXYCHLOR	NA					
delta-BHC	0.29	American woodcock	0.51	Vos et al. 1971 ¹	NA	NA
gamma-BHC (LINDANE)	2.00	Mallard	2.00	Chakravarty and Lahiri 1986 ¹	0.29	2.00
SEMIVOLATILE ORGANIC COMPOUNDS						
1,2,4-TRICHLOROBENZENE	NA					
2,4-DIMETHYLPHENOL	NA				NA	NA
2-METHYLNAPHTHALENE	36.33	Chicken	33.10	Brunstrom et al. 1990 ²	NA	NA
4-METHYLPHENOL	NA				36.33	36.33
ACENAPHTHENE	36.33	Chicken	33.10	Brunstrom et al. 1990 ²	NA	NA
ACENAPHTHYLENE	NA					
ANTHRACENE	0.03	Chicken	0.30	Brunstrom et al. 1990 ²	36.33	36.33
BENZO(a)ANTHRACENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	NA	NA
BENZO(a)PYRENE	0.04	Chicken	0.03	Brunstrom et al. 1990 ²	0.03	0.03
BENZO(b)FLUORANTHENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	0.36	0.36
BENZO(ghi)PERYLENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	0.04	0.04
BENZO(k)FLUORANTHENE	0.04	Chicken	0.33	Brunstrom et al. 1990 ²	0.36	0.36
BENZOIC ACID	NA				0.36	0.36
BENZYL ALCOHOL	NA				0.04	0.04
BIS(2-CHLOROISOPROPYL)ETHER	NA				NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	0.57	American woodcock	1.02	Peakall 1974 ¹	NA	NA
BUTYL BENZYL PHTHALATE	106.03	Chicken embryo	96.60	Bower et al. 1970 ²	0.57	0.57
CHRYSENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	106.03	106.03
Di-n-BUTYL PHTHALATE	0.06	American woodcock	0.10	Peakall 1974 ¹	0.36	0.36
Di-n-OCTYL PHTHALATE	46.32	Chicken	42.24	Bower et al. 1970 ²	0.06	0.06
DIBENZO(a,h)ANTHRACENE ⁴	0.04	Chicken	0.03	Brunstrom et al. 1990 ²	46.32	46.32
					0.04	0.04

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**Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS**
Mallard

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL	Source	Background Intake (mg/kg)	TRV (mg/kg)
DIBENZOFURAN	NA				NA	NA
DIETHYL PHTHALATE	58.28	Chicken	0.33	Brunstrom et al. 1990 ²	58.28	
FLUORANTHENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	0.36	
FLUORENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	0.36	
INDENO(1,2,3-cd)PYRENE	0.09	Chicken	0.83	Brunstrom et al. 1990 ²	0.09	
ISOPHORONE	NA				NA	
NAPHTHALENE	36.33	Chicken	33.10	Brunstrom et al. 1990 ²	36.33	
PENTACHLOROPHENOL	16.92	Mallard	16.92	Nebeker et al. 1994 ²	16.92	
PHENANTHRENE	0.04	Chicken	0.03	Brunstrom et al. 1990 ²	0.04	
PHENOL	19.41	<i>Agelaius phoeniceus</i>	50.30	Schafer et al. 1983 ²	19.41	
PYRENE	0.36	Chicken	0.33	Brunstrom et al. 1990 ²	0.36	
VOLATILE ORGANIC COMPOUNDS						
1,1,1-TRICHLOROETHANE	1.26	Chicken	1.15	Elovaara et al. 1979 ²	1.26	
1,1-DICHLOROETHANE	NA				NA	
1,1-DICHLOROETHENE	NA				NA	
1,2-DICHLOROETHANE	19.17	American woodcock	34.28	Allumot et al. 1976 ¹	19.17	
1,2-DICHLOROETHENE	NA				NA	
2-BUTANONE	NA				NA	
2-HEXANONE	NA				NA	
4-METHYL-2-PENTANONE	NA				NA	
ACETONE	85.61	Chicken	78.00	McLaughlin et al. 1965 ²	85.61	
BENZENE	8.34	Chicken	7.60	McLaughlin et al. 1965 ²	8.34	
CARBON DISULFIDE	NA				NA	
CHLOROETHANE	NA				NA	
CHLOROFORM	NA				NA	
CHLOROMETHANE	NA				NA	
ETHYL BENZENE	NA				NA	
METHYLENE CHLORIDE	0.80	Chicken	0.73	Elovaara et al. 1979 ²	0.80	
TETRACHLOROETHENE	1.57	Chicken	1.43	Elovaara et al. 1979 ²	1.57	
TOLUENE	4.35	Chicken	3.97	Elovaara et al. 1979 ²	4.35	

Toxicity Reference Values (TRVs) Used in Estimating Risks
to Wildlife Receptors from Exposure to PCOCs at RFETS
Mallard

PCOC	NOAEL (mg/kg/day)	Reference Species	Reference Species NOAEL (mg/kg/day)	Source	Background Intake (mg/kg)	TRV (mg/kg)
TOTAL XYLEMES	114.84	Coturnix	267.00	Hill and Camardese 1986 ²		114.84
TRICHLOROETHENE	1.24	Chicken	1.13	Elovaara et al. 1979 ²		1.24
VINYL ACETATE	NA					NA
VINYL CHLORIDE	NA					NA
O-XYLENE	NA					NA
WATER QUALITY PARAMETERS						
NITRITE	NA					NA
NITRATE/NITRITE	0.94	Chicken	1.53	Adams et al. 1966 ²		0.94

¹Based on values used in ORNL 1994.

²Based on values researched by Clemson University.

³Dieldrin values are used for Aldrin.

⁴Dibenz(a,h)anthracene values are extrapolated from Benzo(a)pyrene.

Vegetation Toxicity Reference Values

Subsurface Soil PCOC ¹		Soil Benchmark ²	Group	Units	Vegetation Benchmark Criteria	Soil Benchmark Source	Background UCL ₉₅	Background Concentration ³	Units	Vegetation TRV	
Subsurface	Soil										
ALUMINUM	M	50	MG/KG	EC20	ORNL 1994	14,600	MG/KG	14,600	MG/KG	14,600	
ANTIMONY	M	5	MG/KG	EC20	ORNL 1994	7.14	MG/KG	7.14	MG/KG	7.14	
ARSENIC	M	10	MG/KG	EC20	ORNL 1994	4.42	MG/KG	10	MG/KG	10	
BARIUM	M	500	MG/KG	EC20	ORNL 1994	112	MG/KG	500	MG/KG	500	
BERYLLIUM	M	10	MG/KG	EC20	ORNL 1994	5.46	MG/KG	10	MG/KG	10	
CADMIUM	M	3	MG/KG	EC20	ORNL 1994	0.68	MG/KG	3	MG/KG	3	
CHROMIUM	M	1	MG/KG	EC20	ORNL 1994	22.9	MG/KG	22.9	MG/KG	22.9	
COBALT	M	20	MG/KG	EC20	ORNL 1994	8.55	MG/KG	20	MG/KG	20	
COPPER	M	100	MG/KG	EC20	ORNL 1994	14.7	MG/KG	100	MG/KG	100	
LEAD	M	50	MG/KG	EC20	ORNL 1994	12.0	MG/KG	50	MG/KG	50	
MANGANESE	M	500	MG/KG	EC20	ORNL 1994	275	MG/KG	500	MG/KG	500	
MERCURY	M	0.3	MG/KG	EC20	ORNL 1994	0.27	MG/KG	0.3	MG/KG	0.3	
MOLYBDENUM	M	2	MG/KG	EC20	ORNL 1994	16.9	MG/KG	16.9	MG/KG	16.9	
NICKEL	M	30	MG/KG	EC20	ORNL 1994	23.3	MG/KG	30	MG/KG	30	
SELENIUM	M	1	MG/KG	EC20	ORNL 1994	1.45	MG/KG	1.45	MG/KG	1.45	
SILVER	M	2	MG/KG	EC20	ORNL 1994	7.42	MG/KG	7.42	MG/KG	7.42	
STRONTIUM	M	NA	---	---	---	62.9	MG/KG	62.9	MG/KG	62.9	
VANADIUM	M	2	MG/KG	EC20	ORNL 1994	36.3	MG/KG	36.3	MG/KG	36.3	
ZINC	M	50	MG/KG	EC20	ORNL 1994	44.9	MG/KG	50	MG/KG	50	
NITRATE/NITRITE		W	NA	---	---	---	19.1	MG/KG	19.1	MG/KG	19.1
4,4'-DDT	P	NA	---	---	---	---	---	---	---	---	---
alpha-BHC	P	NA	---	---	---	---	---	---	---	---	---
AROCLOR-1254 ⁴	P	40,000	UG/KG	EC20	ORNL 1994	---	---	40,000	---	---	40,000
AROCLOR-1260 ⁴	P	46,000	UG/KG	EC20	ORNL 1994	---	---	40,000	---	---	40,000
HEPTACHLOR EPoxide	P	NA	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	S	50,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	---	50,000	---	---	50,000
2-CHLOROPHENOL	S	10,000	UG/KG	EC20 ⁶	Hulzebos et al. 1993	---	---	10,000	---	---	10,000
2-METHYLNAPHTHALENE	S	NA	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL	S	20,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	---	20,000	---	---	20,000
4-METHYLPHENOL ⁶	S	20,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	---	20,000	---	---	20,000
4-NITROANILINE	S	NA	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	S	5,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	---	5,000	---	---	5,000
ACENAPHTHYLENE	S	NA	---	---	---	---	---	---	---	---	---

Vegetation Toxicity Reference Values

Subsurface Soil PCOC ¹	Group	Soil Benchmark ²	Units	Vegetation Benchmark Criteria		Soil Benchmark Source	Concentration ³	Units	Background UCL ₉₅	Vegetation TRV
				NA	NA					
ANTHRACENE	S	NA	--	--	--	--	--	--	--	--
BENZO(a)ANTHRACENE	S	NA	--	--	--	--	--	--	--	--
BENZO(a)PYRENE	S	NA	--	--	--	--	--	--	--	--
BENZO(b)FLUORANTHENE	S	NA	--	--	--	--	--	--	--	--
BENZO(g,h)PERYLENE	S	NA	--	--	--	--	--	--	--	--
BENZO(k)FLUORANTHENE	S	NA	--	--	--	--	--	--	--	--
BENZOIC ACID	S	NA	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE ⁷	S	200,000	UG/KG	EC20	ORNL 1994	--	--	--	200,000	--
BUTYL BENZYL PHTHALATE	S	NA	--	--	--	--	--	--	--	--
CHRYSENE	S	NA	--	--	--	--	--	--	--	--
DI-n-BUTYL PHTHALATE	S	200,000	UG/KG	EC20	ORNL 1994	--	--	--	200,000	--
DI-n-OCTYL PHTHALATE ⁷	S	200,000	UG/KG	EC20	ORNL 1994	--	--	--	200,000	--
DIBENZO(a,h)ANTHRACENE	S	NA	--	--	--	--	--	--	--	--
DIBENZOFURAN	S	NA	--	--	--	--	--	--	--	--
DIETHYL PHTHALATE	S	30,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	30,000	--
FLUORANTHENE	S	NA	--	--	--	--	--	--	--	--
FLUORENE	S	NA	--	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE	S	NA	--	--	--	--	--	--	--	--
HEXACHLOROETHANE	S	NA	--	--	--	--	--	--	--	--
INDENO(1,2,3-cd)PYRENE	S	NA	--	--	--	--	--	--	--	--
ISOPHORONE	S	NA	--	--	--	--	--	--	--	--
N-NITROSODIPHENYLMINE	S	NA	--	--	--	--	--	--	--	--
NAPHTHALENE	S	20,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	20,000	--
PENTACHLOROPHENOL	S	600	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	600	--
PHENANTHRENE	S	NA	--	--	--	--	--	--	--	--
PHENOL	S	20,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	20,000	--
PYRENE	S	NA	--	--	--	--	--	--	--	--
1,1,1-TRICHLOROETHANE	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	200,000	--
1,1,2,2-TETRACHLOROETHANE ⁸	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	200,000	--
1,1-DICHLOROETHENE ⁹	V	200,000	UG/KC	EC20 ⁵	Hulzebos et al. 1993	--	--	--	200,000	--
1,2-DICHLOROETHANE ⁸	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	200,000	--
1,2-DICHLOROETHENE ⁹	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	--	--	--	200,000	--
2-BUTANONE	V	NA	--	--	--	--	--	--	--	--
2-CHLOROETHYL VINYL ETHER	V	NA	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE	V	NA	--	--	--	--	--	--	--	--

Vegetation Toxicity Reference Values

Subsurface Soil PCOC ¹	Group	Soil Benchmark ²	Units	Vegetation Benchmark Criteria		Soil Benchmark Source	Background UCL ₉₅ Concentration ³	Vegetation TRV
				NA	---			
ACETONE	V	NA	---	---	---	---	---	---
BENZENE	V	NA	---	---	---	---	---	---
CARBON DISULFIDE	V	NA	---	---	---	---	---	---
CARBON TETRACHLORIDE*	V	NA	---	---	---	---	---	---
CHLOROBENZENE	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	200,000	200,000
CHLOROETHANE ⁶	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	200,000	200,000
CHLOROFORM	V	NA	---	---	---	---	---	---
cis-1,3-DICHLOROPROPENE	V	NA	---	---	---	---	---	---
ETHYLBENZENE	V	NA	---	---	---	---	---	---
METHYLENE CHLORIDE	V	NA	---	---	---	---	---	---
STYRENE	V	60,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	60,000	60,000
TETRACHLOROETHENE	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	200,000	200,000
TOLUENE	V	200,000	UG/KG	EC20	ORNL 1994	---	200,000	200,000
TOTAL XYLEMES ¹⁰	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	200,000	200,000
TRICHLOROETHENE ⁹	V	200,000	UG/KG	EC20 ⁵	Hulzebos et al. 1993	---	200,000	200,000

¹Radiionuclides are not evaluated in the vegetation screen; instead, they are evaluated for small mammals because small mammals are the bounding species.

²Soil benchmark values are rounded to one significant figure. Values from Hulzebos et al. (1993) are based on a 14-day test because it is more appropriate for chronic exposure.

³Background UCL₉₅ is based on a 1-tailed test.

⁴Soil benchmark is based on polychlorinated biphenyls (PCBs).

⁵The EC50 values in Hulzebos et al. (1993) were extrapolated to EC20 values by dividing by a factor of 5 (ORNL 1994).

⁶Soil benchmark is based on 2-methylphenol.

⁷Soil benchmark is based on di-n-butyl phthalate.

⁸Soil benchmark is based on 1,1,1-trichloroethane

⁹Soil benchmark is based on 1,1,1-trichloroethane and tetrachloroethene.

¹⁰Soil benchmark is based on o-xylene.

PCOC - potential chemical of concern

UCL₉₅ - 95% upper confidence limit of the true mean

TRV - toxicity reference value

NA - soil benchmark not available

EC20 - benchmark chemical concentration based on 20% reduction in plant growth

ORNL - Oak Ridge National Laboratory

MG/KG - milligrams per kilogram

UG/KG - micrograms per kilogram

M - metals

P - pesticides/PCBs

W - water quality parameters

S - semivolatile organic compounds

V - volatile organic compounds

**Surface Water Standards for Aquatic Life Sitewide PCOCs
at Rocky Flats Environmental Technology Site**

Chemical	Water Quality Standard ¹	Units	WQS Source
AMERICIUM-241	1,300	pCi/L	H&K 1995
CESIUM-137	8,200	pCi/L	H&K 1995
PLUTONIUM-238	92	pCi/L	H&K 1995
PLUTONIUM-239/240	10C	pCi/L	H&K 1995
STRONTIUM-89, 90	270,000	pCi/L	H&K 1995
URANIUM-233/234	4,300	pCi/L	H&K 1995
URANIUM-235	4,300	pCi/L	H&K 1995
URANIUM-238	4,400	pCi/L	H&K 1995
BARIUM	4	UG/L	ORNL 1994
LEAD ²	2	UG/L	CWQS
LITHIUM	NA	—	—
MAGNESIUM	NA	—	—
MANGANESE	50	UG/L	CWQS
MOLYBDENUM	239	UG/L	ORNL 1994
STRONTIUM	620	UG/L	ORNL 1994
ZINC	45	UG/L	CWQS
2-METHYLNAPHTHALENE	NA	—	—
4-METHYLPHENOL	NA	—	—
DI-n-BUTYLPHthalATE	3.0	UG/L	IRIS
NAPHTHALENE	620	UG/L	CWQS
PENTACHLOROPHENOL ⁴	5.7	UG/L	CWQS
1,1,1-TRICHLOROETHANE ³	18,000	UG/L	IRIS
1,1-DICHLOROETHANE	47	UG/L	ORNL 1994
1,1-DICHLOROETHENE	196	UG/L	ORNL 1994
1,2-DICHLOROETHANE ³	20,000	UG/L	CWQS
1,2-DICHLOROETHENE ³	31.2	UG/L	CWQS
2-BUTANONE	20,800	UG/L	ORNL 1994
4-METHYL-2-PENTANONE	164	UG/L	ORNL 1994
ACETONE	11,200	UG/L	ORNL 1994
BENZENE	45.5	UG/L	ORNL 1994
BENZOIC ACID	41.6	UG/L	ORNL 1994
CARBON DISULFIDE	2	UG/L	IRIS
CHLOROETHANE	230,000	UG/L	IRIS
CHLOROFORM	1,240	UG/L	CWQS
CHLOROMETHANE	5.7	UG/L	CWQS
METHYLENE CHLORIDE	2,240	UG/L	ORNL 1994
TETRACHLOROETHENE	840	UG/L	CWQS
TOLUENE	176	UG/L	ORNL 1994
TOTAL XYLENES	86.2	UG/L	ORNL 1994
TRICHLOROETHENE	21,900	UG/L	CWQS
VINYL ACETATE	20.8	UG/L	ORNL 1994
VINYL CHLORIDE	87.5	UG/L	ORNL 1994

¹All values based on Tier II, secondary chronic values calculated using EPA guidelines unless otherwise noted (EPA 1993).

²Total recoverable lead calculated using the A-series pond's UCL₉₅ for hardness of 51 mg/kg.

³Acute value.

⁴pH dependant standard, the value shown is for pH = 7.0.

WQS - water quality standard

H&K 1995 - Higley and Kuperman 1995

ORNL 1994 - Oak Ridge National Laboratory 1994

CWQS - Colorado Water Quality Standards

IRIS - Integrated Risk Information System

NA - no standard available

Toxicity Reference Value (TRVs) for Sediment PCOCs

Chemical	log K _{ow}	Water Quality TRV	WQS TRV Source	Literature-based Bnchmk		Bnchmk Units	Bnchmk Source	Back-ground UCL ₉₅	Toxicity Reference Value
				Bnchmk	Units				
METALS									
ALUMINUM	--	--	--	NA	mg/kg	ORNL 1994	28025.00	2.80E+04	
ANTIMONY	--	--	--	2	mg/kg	ORNL 1994	7.67	7.67E+00	
ARSENIC	--	--	--	8.2	mg/kg	ORNL 1994	2.97	8.20E+00	
BARIUM	--	--	--	20	mg/kg	ORNL 1994	90.41	9.04E+01	
BERYLLIUM	--	--	--	NA	mg/kg	ORNL 1994	1.50	1.50E+00	
CHROMIUM	--	--	--	81	mg/kg	ORNL 1994	9.75	8.10E+01	
COBALT	--	--	--	NA	mg/kg	ORNL 1994	6.86	6.86E+00	
COPPER	--	--	--	34	mg/kg	ORNL 1994	11.93	3.40E+01	
IRON	--	--	--	30000	mg/kg	ORNL 1994	10216.22	3.00E+04	
LEAD	--	--	--	47	mg/kg	ORNL 1994	39.40	4.67E+01	
MAGNESIUM	--	--	--	NA	mg/kg	ORNL 1994	1800.04	1.80E+03	
MANGANESE	--	--	--	460	mg/kg	ORNL 1994	274.73	4.60E+02	
MERCURY	--	--	--	0.15	mg/kg	ORNL 1994	0.10	2.00E+00	
SELENIUM	--	--	--	NA	mg/kg	ORNL 1994	1.10	1.10E+00	
SILVER	--	--	--	1	mg/kg	ORNL 1994	2.74	2.74E+00	
STRONTIUM	--	--	--	NA	mg/kg	ORNL 1994	49.90	4.99E+01	
VANADIUM	--	--	--	NA	mg/kg	ORNL 1994	21.60	2.16E+01	
ZINC	--	--	--	150	mg/kg	ORNL 1994	71.95	1.50E+02	
RADIOISOTIDES									
AMERICIUM-241	--	--	--	4.60E+04	pCi/g	H&K, 1995	0.31	4.60E+04	
CESIUM-137	--	--	--	4.80E+03	pCi/g	H&K, 1995	0.86	4.80E+03	
PLUTONIUM-239/240	--	--	--	5.20E+05	pCi/g	H&K, 1995	0.94	5.20E+05	
RADIUM-226	--	--	--	3.80E+05	pCi/g	H&K, 1995	0.99	3.80E+05	
RADIUM-228	--	--	--	2.50E+05	pCi/g	H&K, 1995	1.99	2.50E+05	
STRONTIUM-89/90	--	--	--	6.70E+03	pCi/g	H&K, 1995	0.28	6.70E+03	
TRITIUM	--	--	--	3.50E+05	pCi/L	H&K, 1995	263.15	3.50E+05	
URANIUM-233-234	--	--	--	1.00E+04	pCi/g	H&K, 1995	1.96	1.00E+04	
URANIUM-235	--	--	--	1.00E+04	pCi/g	H&K, 1995	0.07	1.00E+04	
URANIUM-238	--	--	--	4.20E+03	pCi/g	H&K, 1995	1.69	4.20E+03	
PESTICIDES/PCBs									
ALDRIN	2.61	0.00000013	CWQS	EqP	ug/kg	EqP	NA	EqP	
AROCLOR-1254	NA	NA	--	20.00	ug/g OC	Interim SQC	NA	20.00	
AROCLOR-1260	7.02	4.4E-08	CWQS	EqP	ug/kg	EqP	NA	EqP	
gamma-BHC (LINDANE)	3.66	0.000019	CWQS	EqP	ug/kg	EqP	NA	EqP	
HEPTACHLOR	4.23	0.00000021	CWQS	EqP	ug/kg	EqP	NA	EqP	
SEMI-VOLATILE ORGANICS									
1,2,4-TRICHLOROBENZENE	3.16	NA	--	NA			NA	NA	
2-METHYLNAPHTHALENE	3.93	NA	--	NA			NA	NA	
ACENAPHTHENE	NA	NA	--	140.00	ug/g OC	Interim SQC	NA	140.00	
ACENAPHTHYLENE	3.68	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
ANTHRACENE	4.42	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
BENZO(a)ANTHRACENE	NA	NA	--	1317.00	ug/g OC	Interim SQC	NA	1317.00	
BENZO(a)PYRENE	NA	NA	--	1036.00	ug/g OC	Interim SQC	NA	1036.00	
BENZO(b)FLUORANTHENE	5.74	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
BENZO(ghi)PERYLENE	6.89	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
BENZO(k)FLUORANTHENE	6.64	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
BENZOIC ACID	2.26	0.0416	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	
BENZYL ALCOHOL	1.98	0.058	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	
BIS (2-CHLOROISOPROPYL)ETHER	1.79	NA	--	NA	NA		NA	NA	
BIS(2-ETHYLHEXYL)PHTHALATE	9.44	0.36	IRIS	EqP	ug/kg	EqP	NA	EqP	
BUTYL BENZYL PHTHALATE	2.18	0.003	IRIS	EqP	ug/kg	EqP	NA	EqP	
CHRYSENE	5.39	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
DI-n-BUTYL PHTHALATE	4.03	0.003	IRIS	EqP	ug/kg	EqP	NA	EqP	
DI-n-OCTYL PHTHALATE	9.04	NA	--	NA	NA		NA	NA	
DIBENZO(a,h)ANTHRACENE	6.22	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
DIBENZOFURAN	4.05	NA	NA	NA	NA		NA	NA	
FLUORANTHENE	NA	NA	NA	1020.00	ug/g OC	Interim SQC	NA	1020.00	

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Toxicity Reference Value (TRVs) for Sediment PCOCs

Chemical	log K _{ow}	Water Quality TRV	WQS TRV Source	Literature-based Bnchmk		Bnchmk Units	Source	Back-ground UCL ₉₅	Toxicity Reference Value
				Bnchmk	Units				
FLUORENE	3.7	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
INDENO(1,2,3-cd)PYRENE	7.49	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
NAPHTHALENE	3.24	0.0000028	CWQS	EqP	ug/kg	EqP	NA	EqP	
PHENANTHRENE	NA	NA	NA	123.00	ug/g OC	Interim SQC	NA	123.00	
PHENOL	1.43	2.56	IRIS	EqP	ug/kg	EqP	NA	EqP	
PYRENE	4.81	0.0000028	CWQS	1311.00	ug/g OC	Interim SQC	NA	1311.00	
VOLATILE ORGANICS									
2-BUTANONE	0.09	20.8	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	
4-METHYL-2-PENTANONE	0.79	0.164	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	
ACETONE	-0.24	11.2	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	
BENZENE	2.06	5.3	IRIS	EqP	ug/kg	EqP	NA	EqP	
METHYLENE CHLORIDE	1.28	0.0047	CWQS	EqP	ug/kg	EqP	NA	EqP	
TOLUENE	2.65	1.75E+01	ORNL 1994	EqP	ug/kg	EqP	NA	EqP	

CWQS - Colorado Water Quality Standards

EqP - calculated using equilibrium partitioning approach (EPA 1992); value depends on site-specific organic carbon content of sediments

Interim SQC - EPA interim sediment quality criterion; value presented is factor used to normalize to organic site-specific carbon content

K_{oc} - octanol-water partition coefficient

NA - not available

OC - organic carbon

WQS - water quality standard

-- - not applicable

IRIS - Integrated Risk Information System

H&K 1995 - Higley and Kuperman (1995)

ORNL 1994 - Oak Ridge National Laboratory (1994)

SUMMARY OF ECOLOGICAL RISK TO
PREBLE'S MEADOW JUMPING MICE

ERA source areas evaluated: All

Exposure Points: Vegetation
Terrestrial arthropods
Dry sediments
Surface soil
Surface water

Highest risk source area: B-Ponds

PCOCs with HQ > 10: none

Highest HQ: 3.9 - selenium in Soil Dump Area

Key uncertainties in exposure and risk estimate:

- Except for pesticides and PCBs, concentrations of organic contaminants in biological tissue not available. However, most are metabolized and probably do not accumulate in terrestrial biota.
- Data on PCOCs in terrestrial arthropods not available for all areas. Data were replaced with estimates if reliable uptake ratios from adjacent areas were available.

SUMMARY OF ECOLOGICAL RISK TO
PREBLE'S MEADOW JUMPING MICE
(continued)

Suggested further action:

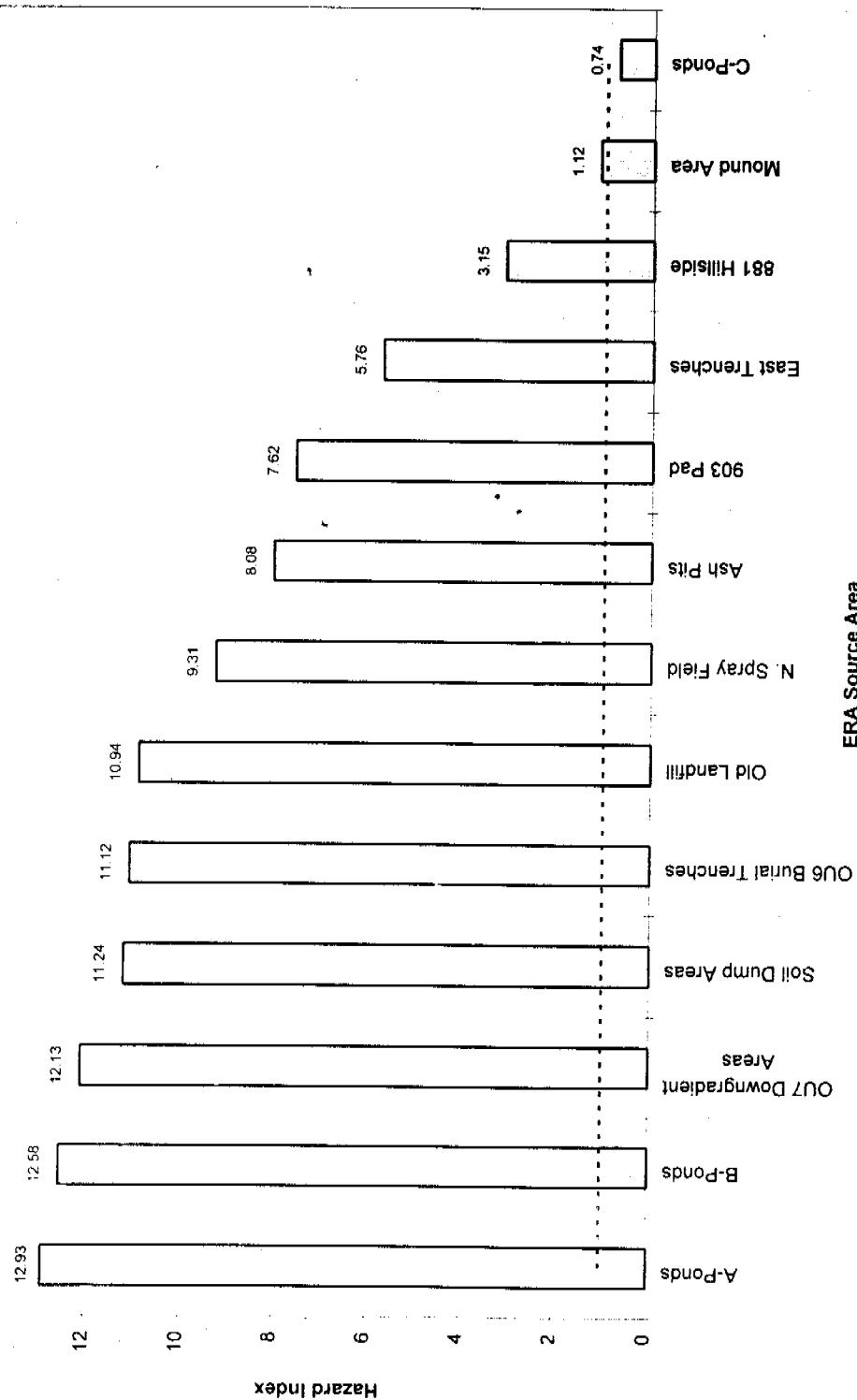
ECOCs: Chromium in OU 2 areas
Selenium in Soil Dump Area and pond areas

1. Evaluate potential sources and factors affecting bioaccumulation of chromium and selenium in vegetation in Soil Dump Area
2. Evaluate source of copper in terrestrial arthropods in OU 2
3. Evaluate exposure to organic PCOCs in subsurface soils in 881 Hillside and Old Landfill areas. Pathways include inhalation of PCOCs in burrow air and ingestion of subsurface soils while burrowing and dermal contact. Further analyses would also consider:
 - seasonal exposure patterns
 - impacts of potential phytotoxicity on habitat quality

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice at RFETS

Contribution of ERA Source Areas to Preble's Meadow Jumping Mice
Risk of Toxic Exposure

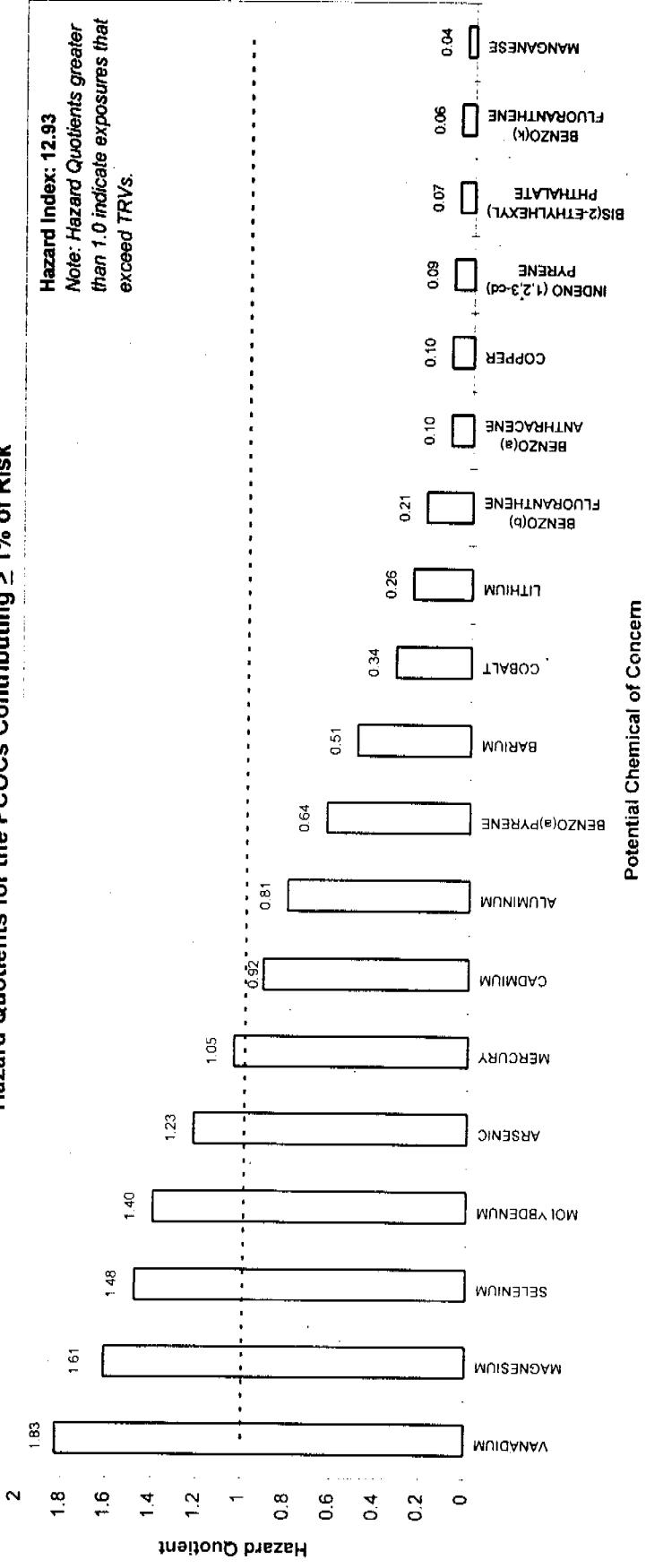
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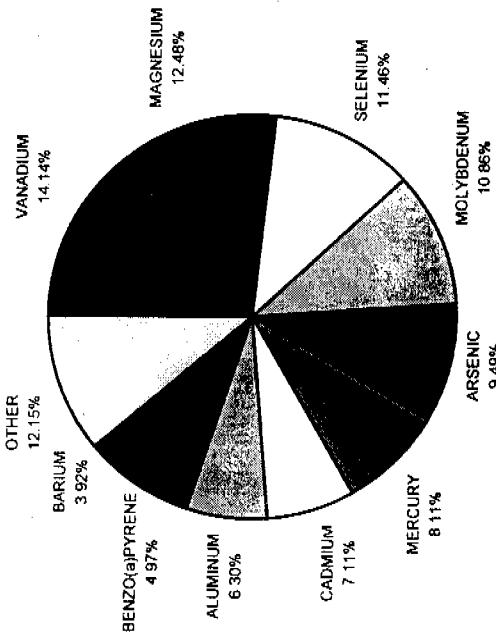
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the A-Ponds Source Area at RFETS

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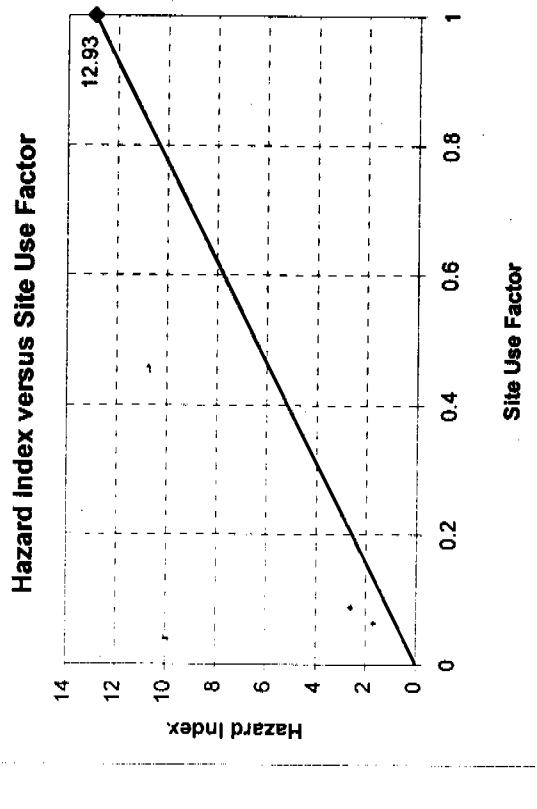
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

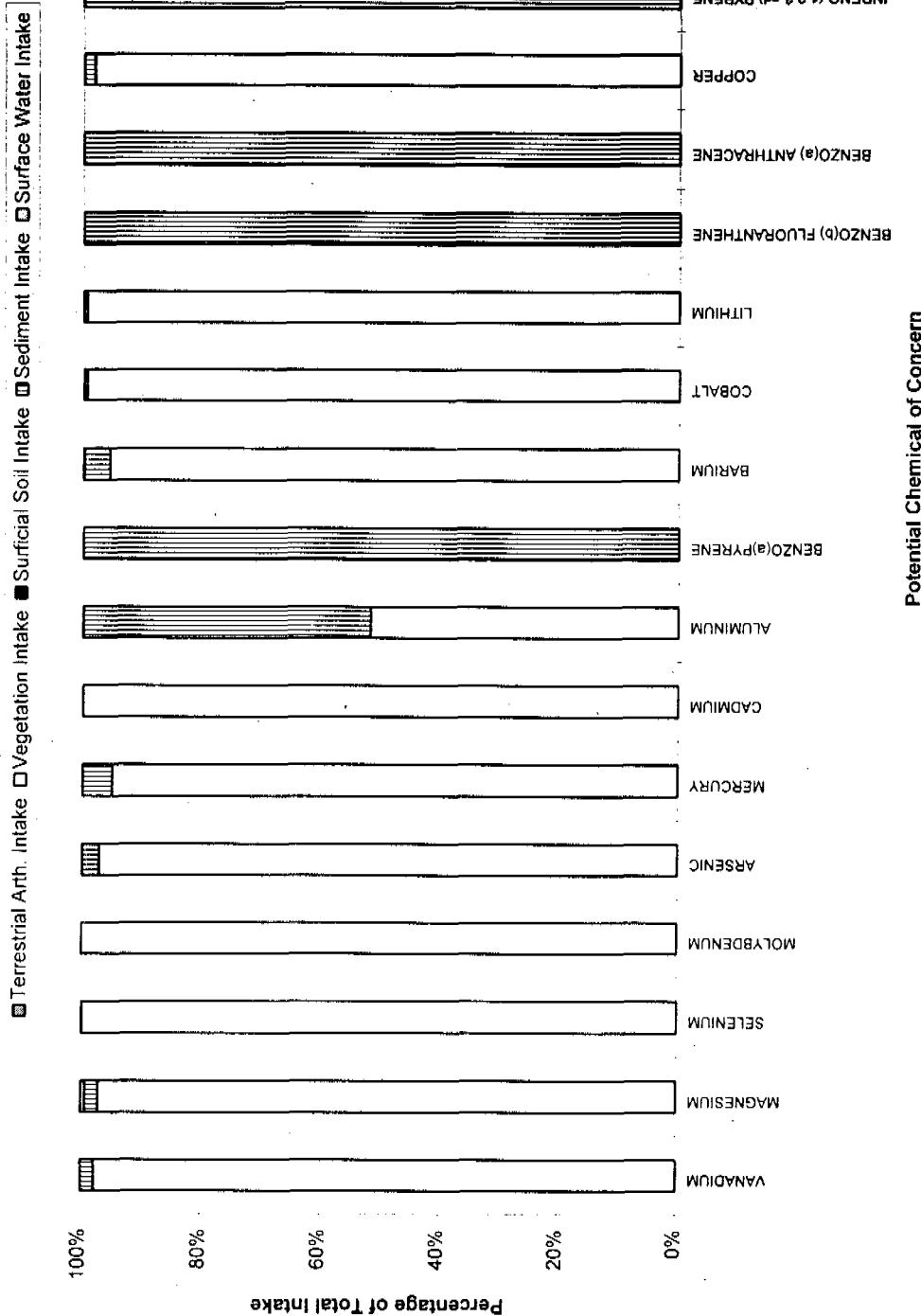


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the A-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the A-Ponds Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										Surface Water	
A-PONDS		Terrestrial Arth.					Surficial Soil					Sediment	
Analyte	PCOC for OUG	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅
VANADIUM	X	NR	—	IR = 0.17 SUF = 1.0	21.79	3.70	NC	—	IR = 0.00204 SUF = 1.0	40.78	0.08	2.30E-03	3.44E-04
MAGNESIUM	X	NR	—	2252.60	382.94	NC	—	4107.97	8.38	—	18.85	2.83	—
SELENIUM	X	NR	—	2.52	0.43	ND	—	NR	—	—	3.28E-03	4.92E-04	—
MOLYBDENUM	X	NR	—	95.43	16.22	NC	—	NR	—	—	3.08E-03	4.62E-04	—
ARSENIC	X	NR	—	4.42	0.75	NC	—	10.45	0.02	3.55E-03	5.33E-04	—	—
MERCURY	X	NR	—	0.10	0.02	ND	—	0.42	8.48E-04	1.49E-04	2.24E-05	—	—
CADMIUM	X	NR	—	2.44	0.41	NC	—	NR	—	—	9.62E-04	1.44E-04	—
ALUMINUM	X	NR	—	238.69	40.58	NC	—	18345.88	37.43	0.41	0.06	—	—
BENZO(a)PYRENE	X	NR	—	NR	—	ND	—	366.28	0.75	ND	—	—	—
BARIUM	X	NR	—	40.57	6.90	NC	—	150.63	0.31	0.06	0.01	—	—
COBALT	X	NR	—	25.99	4.42	NC	—	12.63	0.03	1.46E-03	2.19E-04	—	—
LITHIUM	X	NR	—	37.90	6.44	NC	—	17.63	0.04	0.03	4.59E-03	—	—
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	ND	—	1170.53	2.39	ND	—	—	—
BENZO(a)ANTHRACENE	X	NR	—	NR	—	ND	—	559.32	1.14	ND	—	—	—
COPPER	X	NR	—	24.12	4.10	NC	—	36.35	0.07	2.10E-03	3.15E-04	—	—
INDENO(1,2,3- <i>cd</i>) PYRENE	X	NR	—	NR	—	ND	—	512.27	1.05	ND	—	—	—
BIS(2-ETHYLHEXYL) PHTHALATE	X	NR	—	NR	—	ND	—	695.41	1.42	ND	—	—	—
BENZO(k)FLUORANTHENE	X	NR	—	NR	—	ND	—	352.85	0.72	ND	—	—	—
MANGANESE	X	NR	—	42.44	7.21	NC	—	536.77	1.10	0.18	0.03	—	—
NICKEL	X	NR	—	18.03	3.07	NC	—	22.99	0.05	2.78E-03	4.17E-04	—	—
STRONTIUM	X	NR	—	112.50	19.13	NC	—	71.35	0.15	0.28	0.04	—	—
ZINC	X	NR	—	57.29	9.74	NC	—	278.25	0.57	0.01	1.23E-03	—	—
PYRENE	X	NR	—	NR	—	ND	—	1034.25	2.11	ND	—	—	—
FLUORANTHENE	X	NR	—	NR	—	ND	—	1543.09	3.15	ND	—	—	—
TIN		NR	—	5.80	0.99	NC	—	NR	—	ND	—	—	—
LEAD	X	NR	—	1.11	0.19	NC	—	45.07	0.09	3.32E-03	4.98E-04	—	—
CHRYSENE	X	NR	—	NR	—	ND	—	644.49	1.31	ND	—	—	—
ANTIMONY	X	NR	—	ND	—	ND	—	NR	—	0.01	1.33E-03	—	—
BENZO(g,h)PERYLENE	X	NR	—	NR	—	ND	—	512.27	1.05	ND	—	—	—
PHENANTHRENE	X	NR	—	NR	—	ND	—	810.77	1.65	ND	—	—	—
METHYLENE CHLORIDE	X	NR	—	NR	—	NR	—	—	—	2.94E-03	4.41E-04	—	—
SILVER	X	NR	—	ND	—	ND	—	NR	—	1.86E-03	2.79E-04	—	—
CHROMIUM	X	NR	—	ND	—	NC	—	13.55	0.03	1.63E-03	2.45E-04	—	—
Di-n-BUTYL PHTHALATE	X	NR	—	NR	—	ND	—	NR	—	4.83E-03	7.25E-04	—	—

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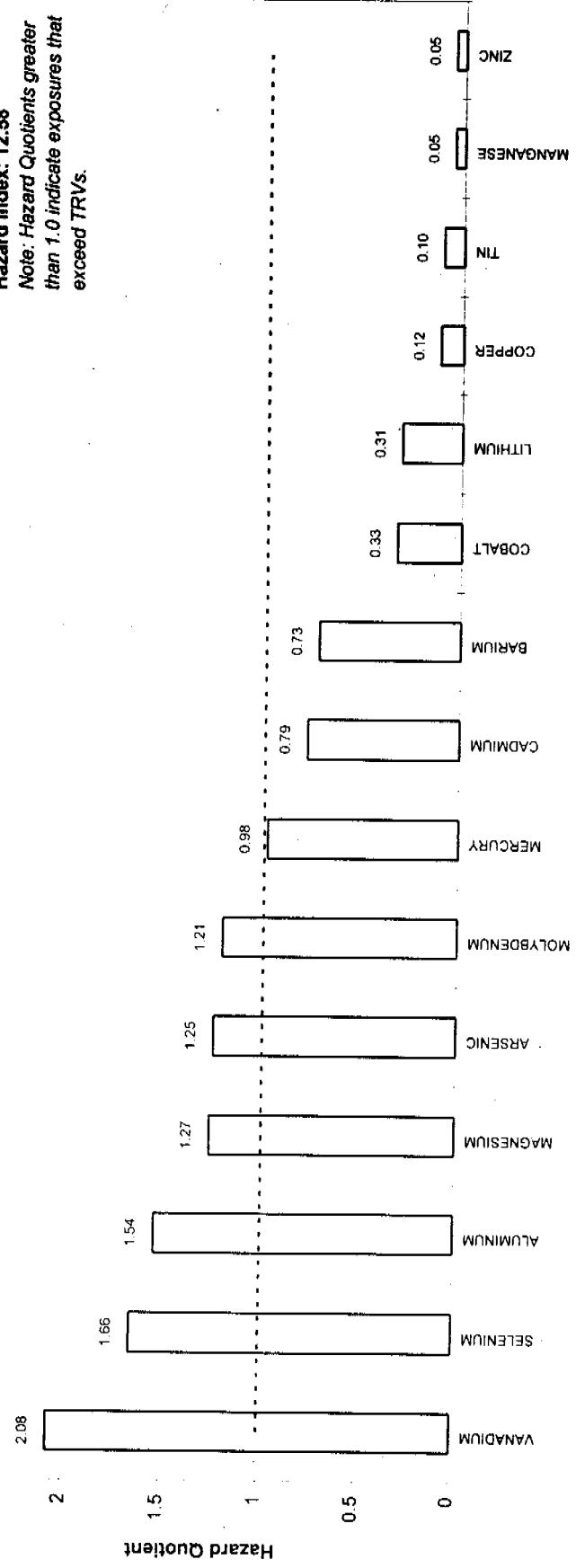
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the A-Ponds Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		PCOC for OU6	SUMMARY			
Analyte	A-PONDS		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
VANADIUM	X	3.79	2.07	1.83	14.14%	
MAGNESIUM	X	394.15	244.23	1.61	12.48%	
SELENIUM	X	0.43	0.29	1.48	11.46%	
MOLYBDENUM	X	16.22	11.55	1.40	10.86%	
ARSENIC	X	0.77	0.63	1.23	9.49%	
MERCURY	X	0.02	0.02	1.05	8.11%	
CADMIUM	X	0.41	0.45	0.92	7.11%	
ALUMINUM	X	78.06	95.89	0.81	6.30%	
BENZO(a)PYRENE	X	0.75	1.16	0.64	4.97%	
BARIUM	X	7.21	14.22	0.51	3.92%	
COBALT	X	4.44	13.19	0.34	2.60%	
LITHIUM	X	6.48	24.57	0.26	2.04%	
BENZO(b) FLUORANTHENE	X	2.39	11.63	0.21	1.59%	
BENZO(a) ANTHRACENE	X	1.14	11.63	0.10	0.76%	
COPPER	X	4.18	43.33	0.10	0.75%	
INDENO (1,2,3-cd) PYRENÉ	X	1.05	11.63	0.09	0.69%	
BIS(2-ETHYLHEXYL) PHTHALATE	X	1.42	21.32	0.07	0.51%	
BENZO(k) FLUORANTHENE	X	0.72	11.63	0.06	0.48%	
MANGANESE	X	8.34	230.26	0.04	0.28%	
NICKEL	X	3.11	104.67	0.03	0.23%	
STRONTIUM	X	19.31	688.18*	0.03	0.22%	
ZINC	X	10.31	418.66	0.02	0.19%	
PYRENE	X	2.11	87.32	0.02	0.19%	
FLUORANTHENE	X	3.15	145.53	0.02	0.17%	
TIN		0.99	65.96	0.01	0.12%	
LEAD	X	0.28	20.93	0.01	0.10%	
CHRYSENE	X	1.31	116.34	0.01	0.09%	
ANTIMONY	X	0.00	0.14	0.01	0.07%	
BENZO(ghi)PERYLENE	X	1.05	116.34	0.01	0.07%	
PHENANTHRENE	X	1.65	1163.43	<0.01	0.01%	
METHYLENE CHLORIDE	X	0.00	15.31	<0.01	<0.01%	
SILVER	X	0.00	58.63	<0.01	<0.01%	
CHROMIUM	X	0.03	7161.75	<0.01	<0.01%	
DI-n-BUTYL PHTHALATE	X	0.00	329.81	<0.01	<0.01%	

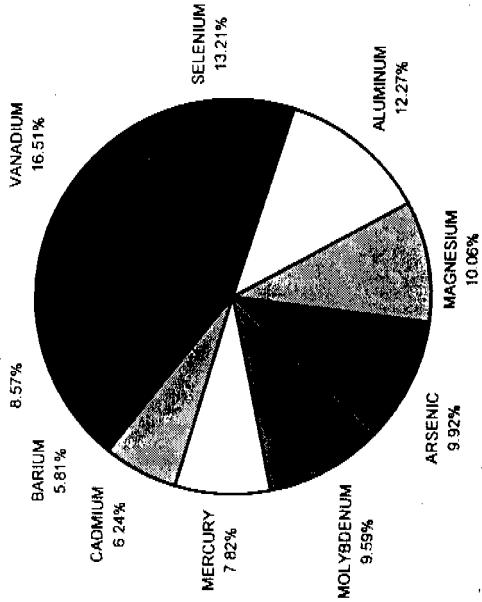
HAZARD INDEX 12.93

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the B-Ponds Source Area at RFETS

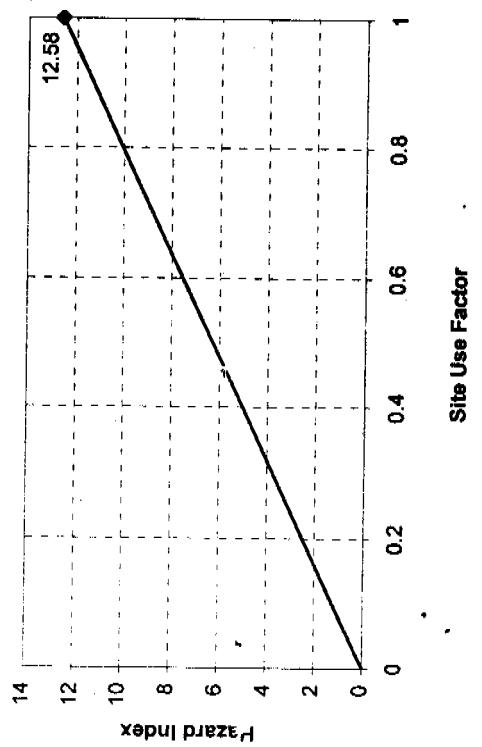
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

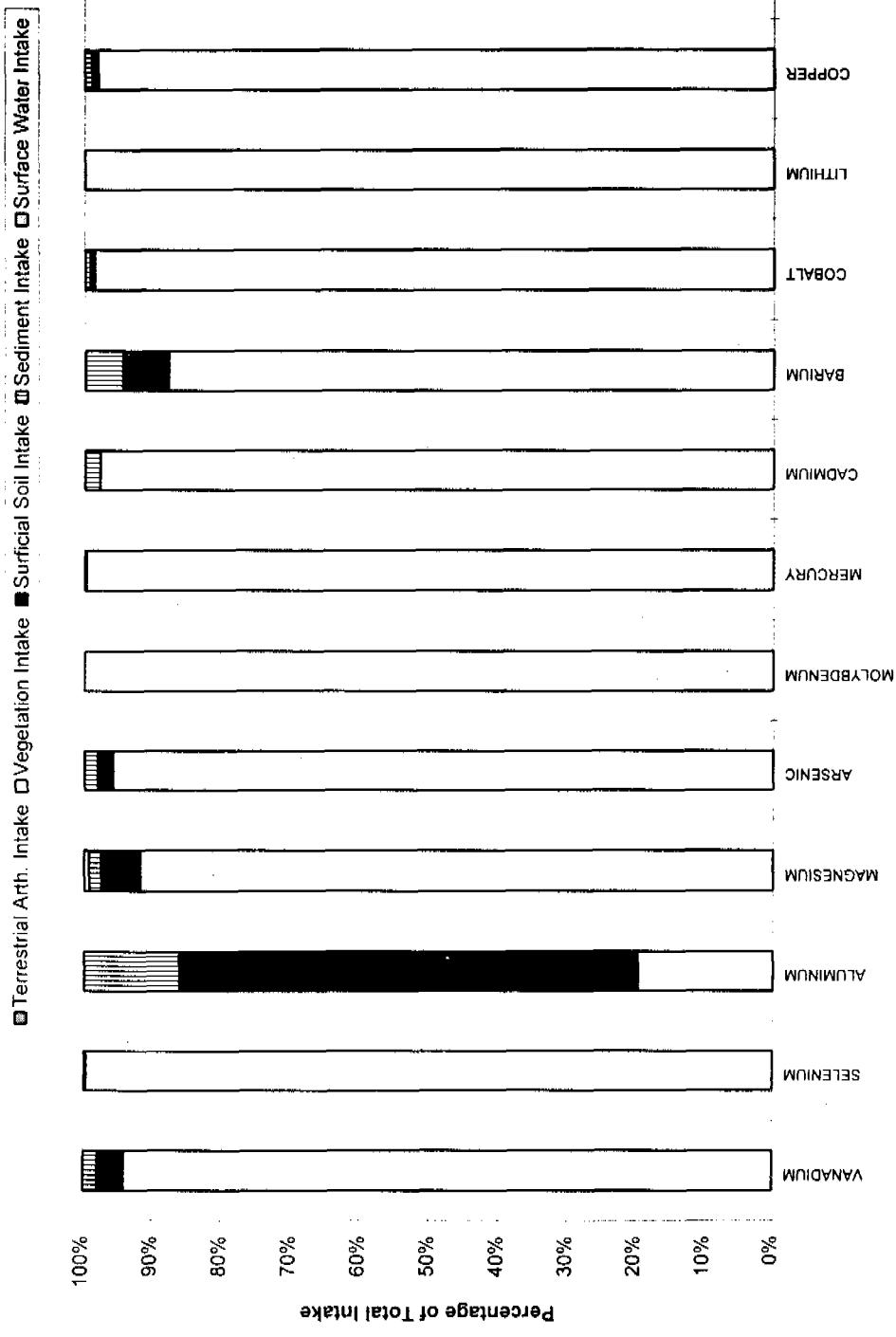


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the B-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the B-Ponds Source Area at RFETS

B-PONDS		EXPOSURE POINT											
		Terrestrial Arth.				Vegetation				Sediment			
		UC _{L₉₅}	Intake	UC _{L₉₅}	Estimated Value	UC _{L₉₅}	Intake	UC _{L₉₅}	Intake	UC _{L₉₅}	Intake	UC _{L₉₅}	Intake
VANADIUM	X	PCOC for OU6	IR = NR SUF = 1.0	IR = 0.17 SUF = 1.0	23.81	4.05	80.61	0.16	43.46	0.09	2.85E-03	4.28E-04	SUF = 1.0
SELENIUM	NR	—	—	2.82	0.48	ND	—	6.53	1.08E-03	2.02E-03	3.03E-04	—	—
ALUMINUM	NR	—	—	172.53	29.33	48139.56	98.20	10022.07	20.45	0.26	0.04	—	—
MAGNESIUM	X	NR	—	1669.75	283.86	8678.88	17.70	2599.13	5.30	15.50	2.33	—	—
ARSENIC	X	NR	—	4.44	0.75	8.55	0.02	7.36	0.02	2.25E-03	3.38E-04	—	—
MOLYBDENUM	X	NR	—	82.01	13.94	ND	—	NR	—	—	—	0.01	1.10E-03
MERCURY	X	NR	—	0.10	0.02	ND	—	NR	—	—	—	2.75E-04	4.13E-05
CADMUM	NR	—	—	2.03	0.35	ND	—	3.79	0.01	9.86E-04	1.48E-04	—	—
BARIUM	X	NR	—	53.77	9.14	337.48	0.69	272.40	0.56	0.05	0.01	—	—
COBALT	X	NR	—	25.51	4.34	*13.25	0.03	16.24	0.03	1.58E-03	2.37E-04	—	—
LITHIUM	NR	—	45.27	7.70	NC	—	NR	—	—	0.02	2.60E-03	—	—
COPPER	X	NR	—	29.45	5.01	21.78	0.04	25.34	0.05	ND	—	—	—
TIN	NR	—	40.49	6.88	ND	—	NR	—	—	0.01	9.52E-04	—	—
MANGANESE	X	NR	—	53.95	9.17	509.65	1.04	499.96	1.02	0.10	0.01	—	—
ZINC	X	NR	—	116.03	19.73	112.99	0.23	175.19	0.36	0.03	3.91E-03	—	—
NICKEL	X	NR	—	13.89	2.36	18.05	0.04	27.04	0.06	3.56E-03	5.34E-04	—	—
LEAD	X	NR	—	1.27	0.22	55.00	0.11	24.15	0.05	0.01	7.69E-04	—	—
STRONTIUM	X	NR	—	66.45	11.30	NC	—	63.99	0.13	0.26	0.04	—	—
SILVER	X	NR	—	5.01	0.85	ND	—	1.37	2.79E-03	ND	—	—	—
ACROCLOR-1254	X	NR	—	0.01	1.74E-03	ND	—	NR	—	NR	—	—	—
THALLIUM	NR	—	ND	—	3.05	0.01	NR	—	NR	—	—	—	—
ANTIMONY	X	NR	—	ND	—	ND	—	NR	—	0.01	1.59E-03	—	—
BERYLLIUM	NR	—	ND	—	6.57	0.01	NR	—	NR	—	0.01	1.28E-03	—
CHROMIUM	X	NR	—	5.29	0.90	48.86	0.10	8.72	0.02	2.21E-03	3.32E-04	—	—
ACETONE	X	NR	—	NR	—	NR	—	NR	—	NR	—	3.66E-03	5.48E-04
TETRACHLOROETHENE	X	NR	—	NR	—	NR	—	NR	—	NR	—	2.53E-03	3.79E-04
1,2-DICHLOROETHENE	X	NR	—	NR	—	NR	—	NR	—	NR	—	2.26E-03	3.39E-04
CHLOROFORM	X	NR	—	NR	—	NR	—	NR	—	NR	—	2.54E-03	3.81E-04
1,2-DICHLOROETHANE	X	NR	—	NR	—	NR	—	NR	—	NR	—	2.88E-03	4.31E-04
TRICHLOROETHENE	X	NR	—	NR	—	NR	—	NR	—	NR	—	4.98E-03	7.47E-04
Di-n-BUTYL PHTHALATE	X	NR	—	NR	—	ND	—	NR	—	NR	—	—	—

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Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the B-Ponds Source Area at RFETS

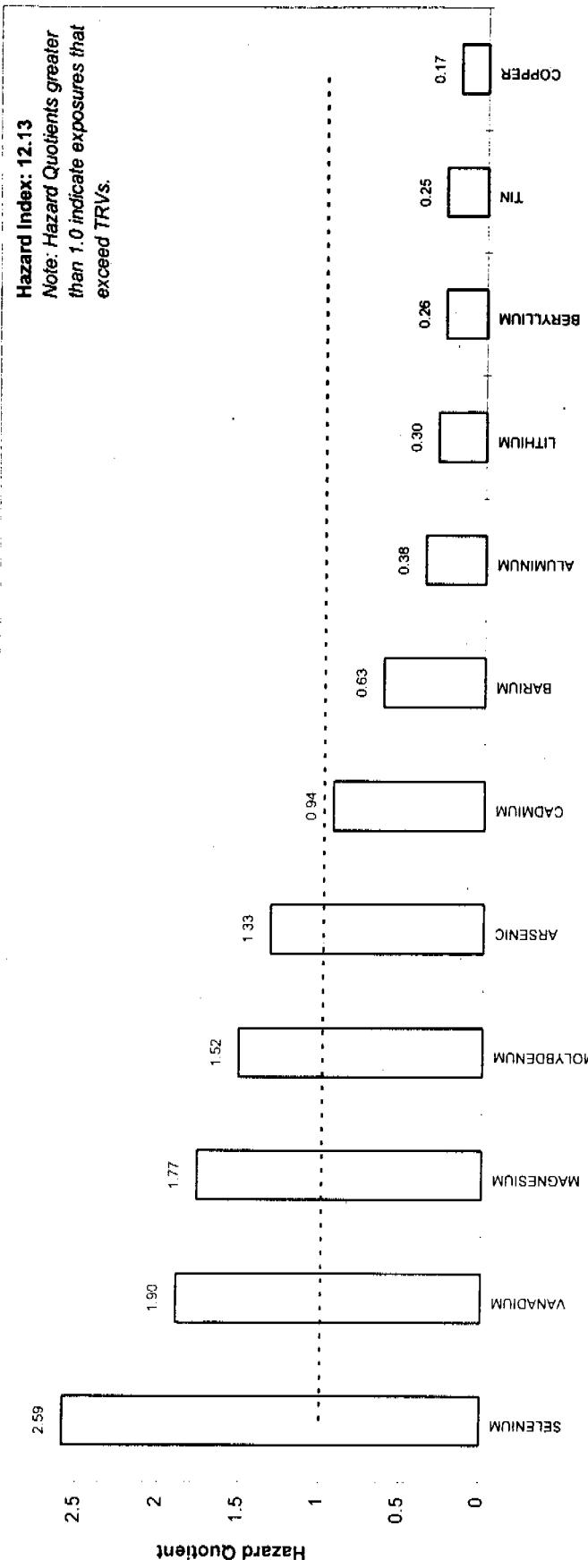
PREBLE'S MEADOW JUMPING MOUSE		SUMMARY			
Analyte	PCOC for OU6	Total	Toxicity	Hazard	Percent of
		Intake	Reference Value	Quotient	Total Risk
VANADIUM	X	4.30	2.07	2.08	16.51%
SELENIUM		0.48	0.29	1.66	13.21%
ALUMINUM		148.02	95.89	1.54	12.27%
MAGNESIUM	X	309.19	244.23	1.27	10.06%
ARSENIC	X	0.79	0.63	1.25	9.92%
MOLYBDENUM	X	13.94	11.55	1.21	9.59%
MERCURY	X	0.02	0.02	0.98	7.82%
CADMIUM		0.35	0.45	0.79	6.24%
BARIUM	X	10.39	14.22	0.73	5.81%
COBALT	X	4.40	13.19	0.33	5.65%
LITHIUM		7.70	24.57	0.31	2.49%
COPPER	X	5.10	43.33	0.12	0.94%
TIN		6.88	65.96	0.10	0.83%
MANGANESE	X	11.25	230.26	0.05	0.39%
ZINC	X	20.32	418.66	0.05	0.39%
NICKEL	X	2.45	104.67	0.02	0.19%
LEAD	X	0.38	20.93	0.02	0.14%
STRONTIUM	X	11.47	688.18	0.02	0.13%
SILVER	X	0.85	58.63	0.01	0.12%
AROCLOR-1254	X	1.74E-03	0.14	0.01	0.10%
THALLIUM		0.01	0.60	0.01	0.08%
ANTIMONY	X	1.28E-03	0.14	0.01	0.07%
BERYLLIUM		0.01	1.73	0.01	0.06%
CHROMIUM	X	1.02	7161.75	<0.01	<0.01%
ACETONE	X	1.59E-03	26.17	<0.01	<0.01%
TETRACHLOROETHENE	X	5.48E-04	16.30	<0.01	<0.01%
1,2-DICHLOROETHENE	X	3.79E-04	19.79	<0.01	<0.01%
CHLOROFORM	X	3.39E-04	39.25	<0.01	<0.01%
1,2-DICHLOROETHANE	X	3.81E-04	61.19	<0.01	<0.01%
TRICHLOROETHENE	X	4.31E-04	171.04	<0.01	<0.01%
Di-n-CUTYL PHTHALATE	X	7.47E-04	329.81	<0.01	<0.01%

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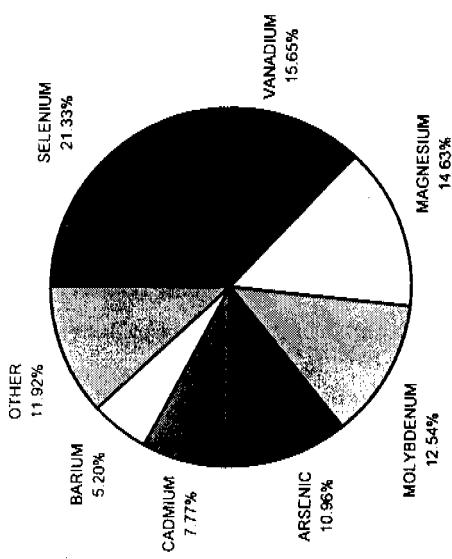
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU7 Downgradient Areas Source Area at RFETS

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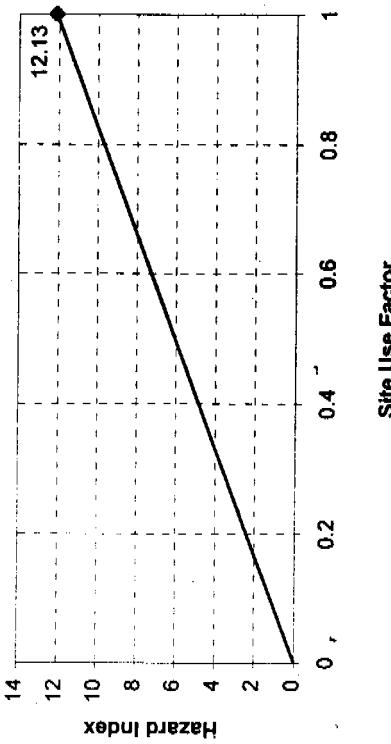
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

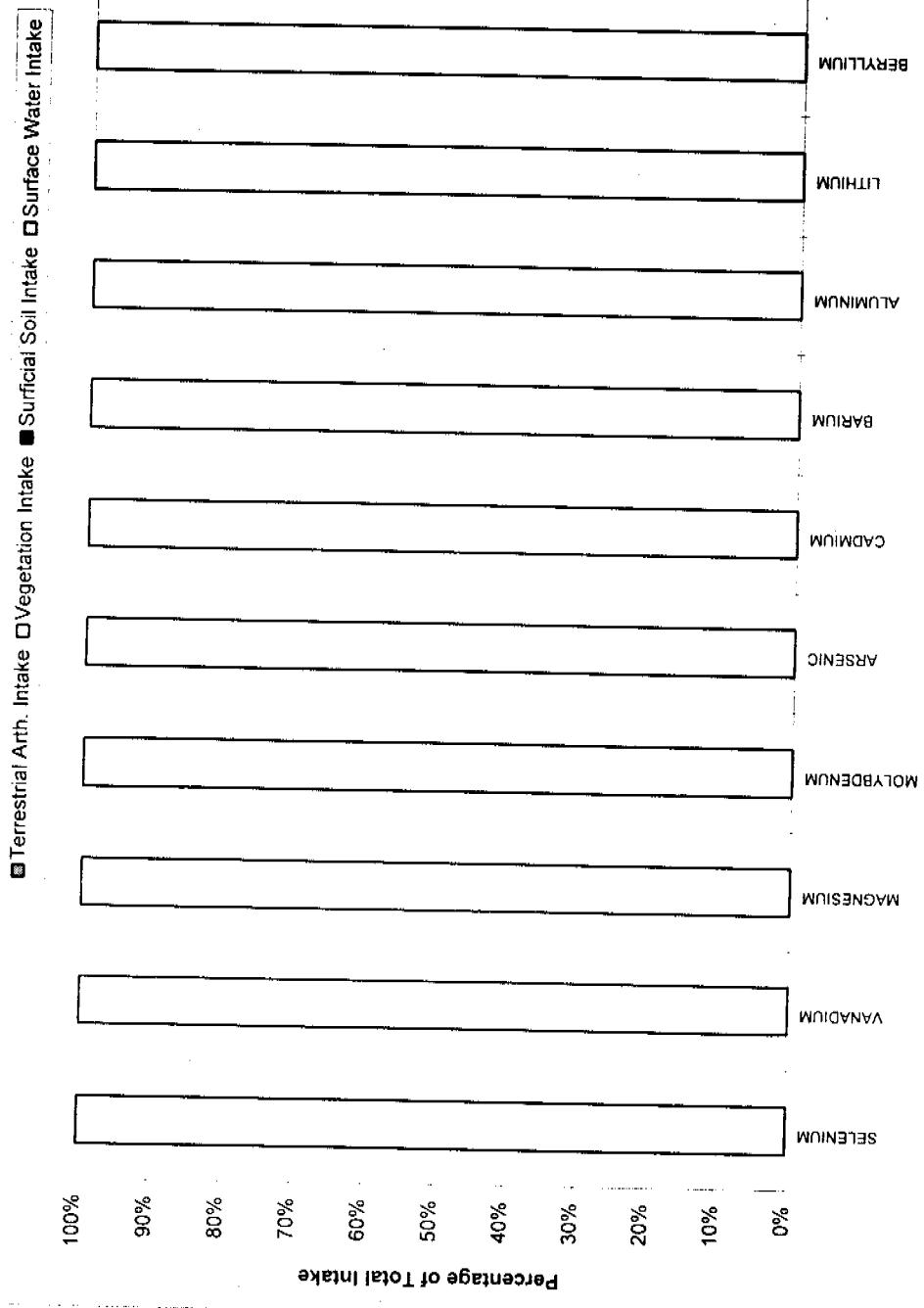


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU7 Downgradient Areas Source Area at RFETS

Contribution of Exposure Points to Total Intake



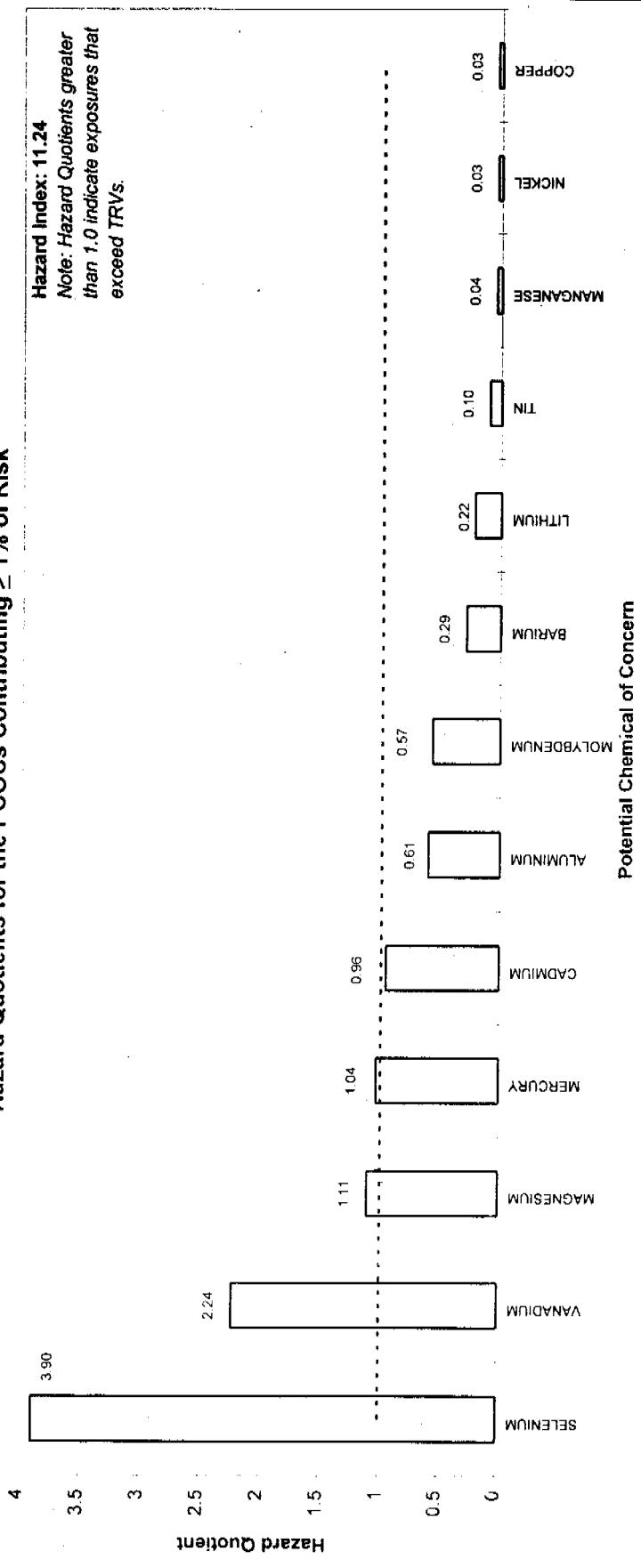
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU7 Downgradient Areas Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY			
		Terrestrial Arth.			Vegetation			Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU7	UCI ₉₅	Intake	UCI ₉₅	Intake	Estimated Value	Intake	UCI ₉₅	Intake	UCI ₉₅	Intake	IR = I	SUF = I	SUF = I	
		IR = NR	SUF = 1.0	IR = 0.17	SUF = 1.0			IR = 0.00408	SUF = 1.0						
SELENIUM	X	NR	—	4.40	—	0.75	NR	—	0.01	—	0.75	0.29	2.59	21.33%	
VANADIUM	X	NR	—	23.12	—	3.93	NR	—	0.01	—	3.93	2.07	1.90	15.65%	
MAGNESIUM	X	NR	—	2549.84	—	433.47	NR	—	25.70	—	433.47	244.23	1.77	14.63%	
MOLYBDENUM	X	NR	—	103.42	—	17.58	NR	—	0.03	—	17.58	11.55	1.52	12.54%	
ARSENIC	X	NR	—	4.93	—	0.84	NR	—	3.31E-03	—	0.84	0.63	1.33	10.96%	
CADMIUM	X	NR	—	2.50	—	0.42	NR	—	1.85E-03	—	0.42	0.45	0.94	7.77%	
BARIUM	X	NR	—	52.80	—	8.98	NR	—	0.19	—	8.98	14.22	0.63	5.20%	
ALUMINUM	X	NR	—	212.41	—	36.11	NR	—	0.40	—	36.11	95.89	0.38	3.10%	
LITHIUM	X	NR	—	43.21	—	7.35	NR	—	0.03	—	7.35	24.57	0.30	2.46%	
BERYLLIUM	X	NR	—	2.59	—	0.44	NR	—	ND	—	0.44	1.73	0.26	2.10%	
TIN	X	NR	—	98.49	—	16.74	NR	—	0.03	—	16.74	65.96	0.25	2.09%	
COPPER	X	NR	—	42.78	—	7.27	NR	—	0.01	—	7.27	43.33	0.17	1.38%	
NICKEL	X	NR	—	18.74	—	3.19	NR	—	0.01	—	3.19	104.67	0.03	0.25%	
STRONTIUM	X	NR	—	91.65	—	15.58	NR	—	0.77	—	15.58	688.18	0.02	0.19%	
MANGANESE	X	NR	—	18.57	—	3.16	NR	—	0.08	—	3.16	230.26	0.01	0.11%	
ZINC	X	NR	—	32.78	—	5.57	NR	—	0.06	—	5.57	418.66	0.01	0.11%	
LEAD	X	NR	—	1.53	—	0.26	NR	—	0.01	—	0.26	20.93	0.01	0.10%	
NITRATE/NITRITE	X	NR	—	NR	—	0	NR	—	1.06	—	0.04	34.67	<0.01	0.01%	
CHROMIUM	X	NR	—	7.41	—	1.26	NR	—	ND	—	1.26	7161.75	<0.01	<0.01%	

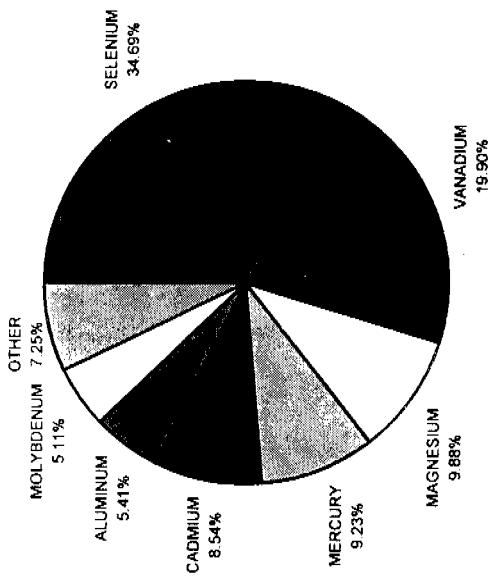
HAZARD INDEX 12.13

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Soil Dump Areas Source Area at RFETS

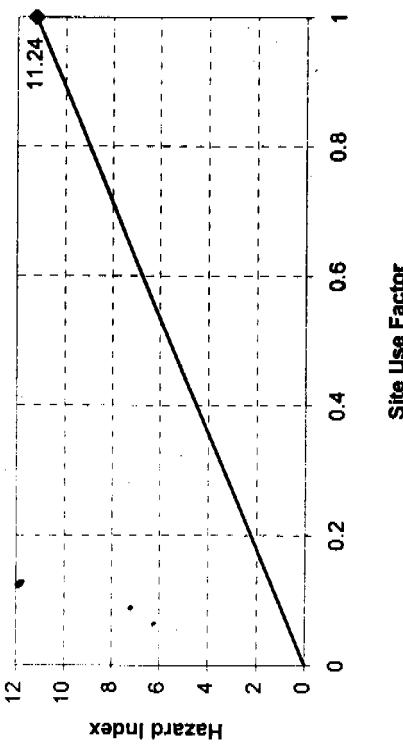
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

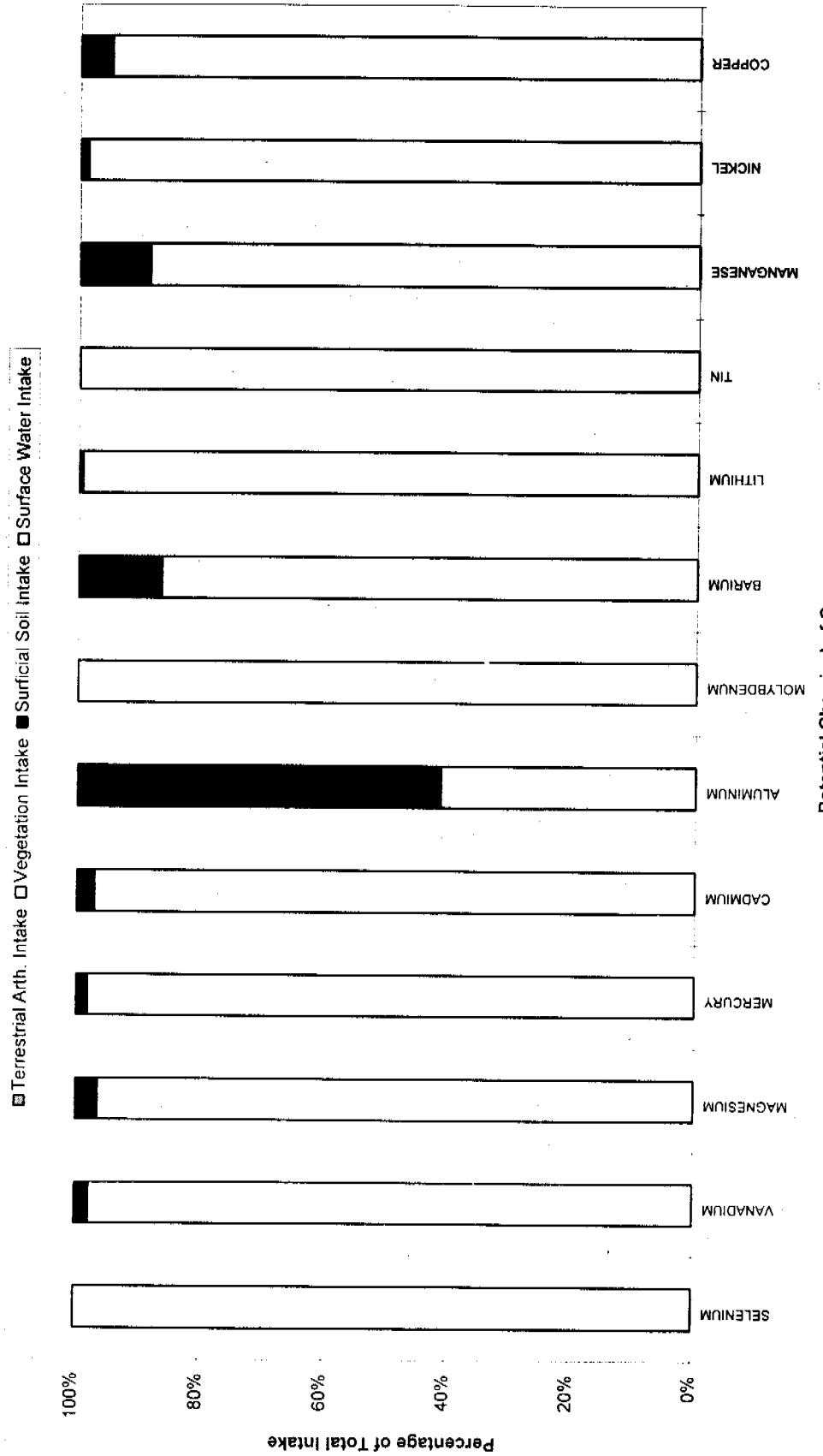


Hazard Index versus Site Use Factor

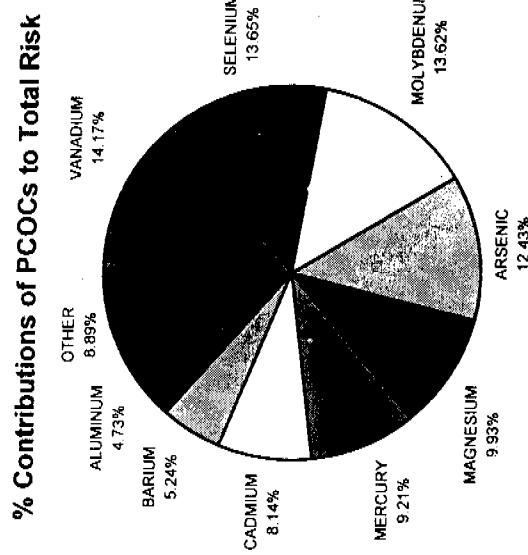
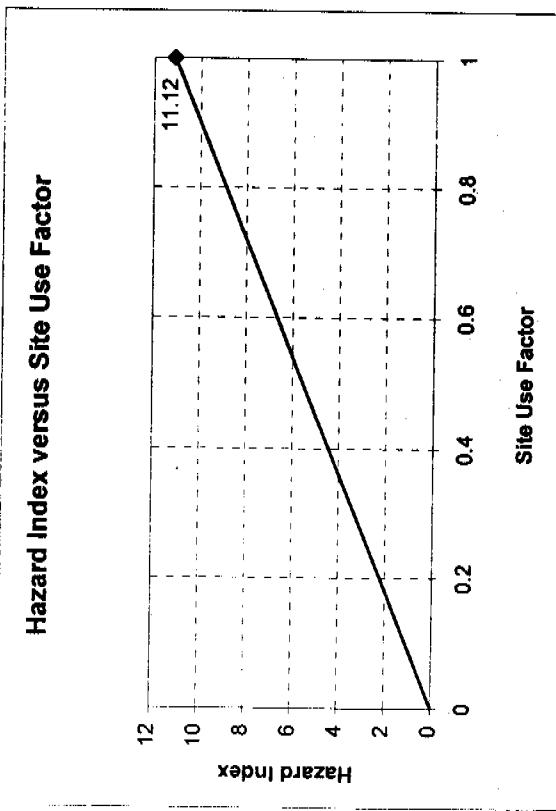
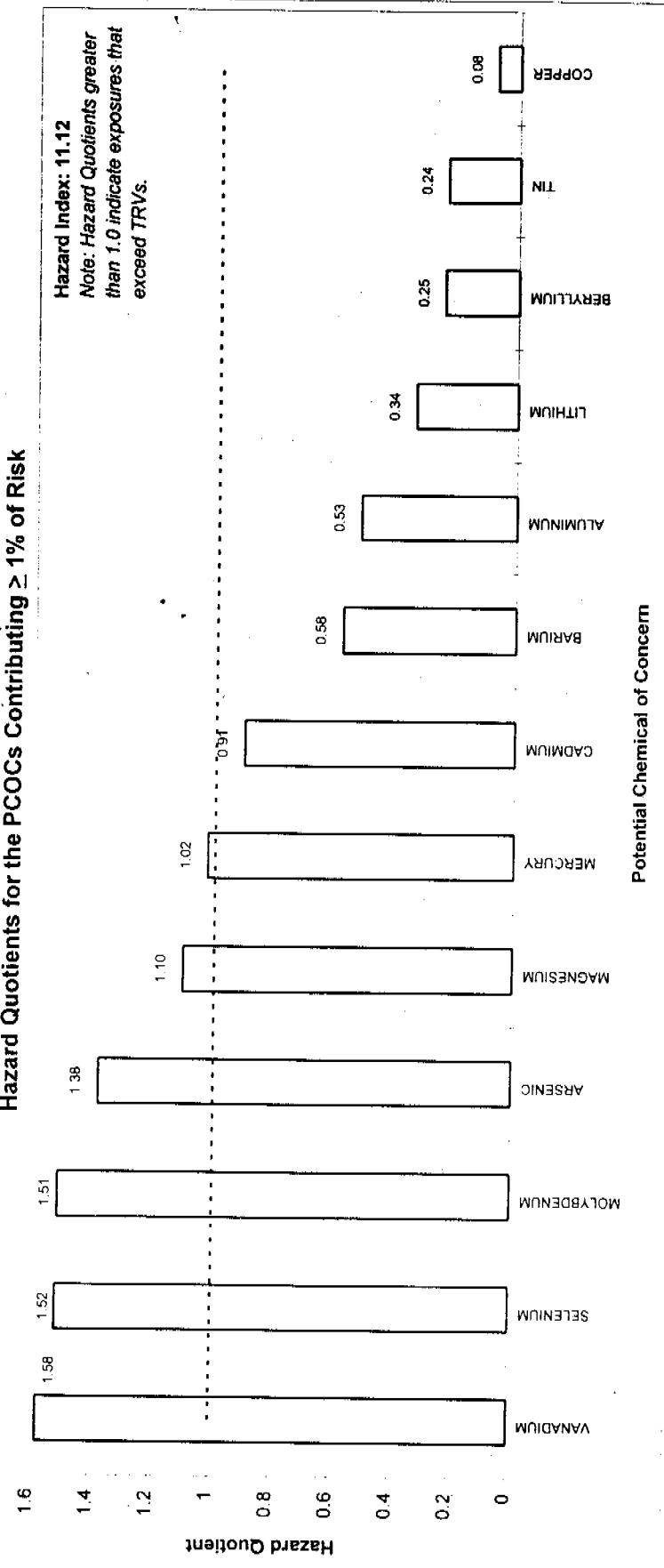


Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Soil Dump Areas Source Area at RFETS

Contribution of Exposure Points to Total Intake

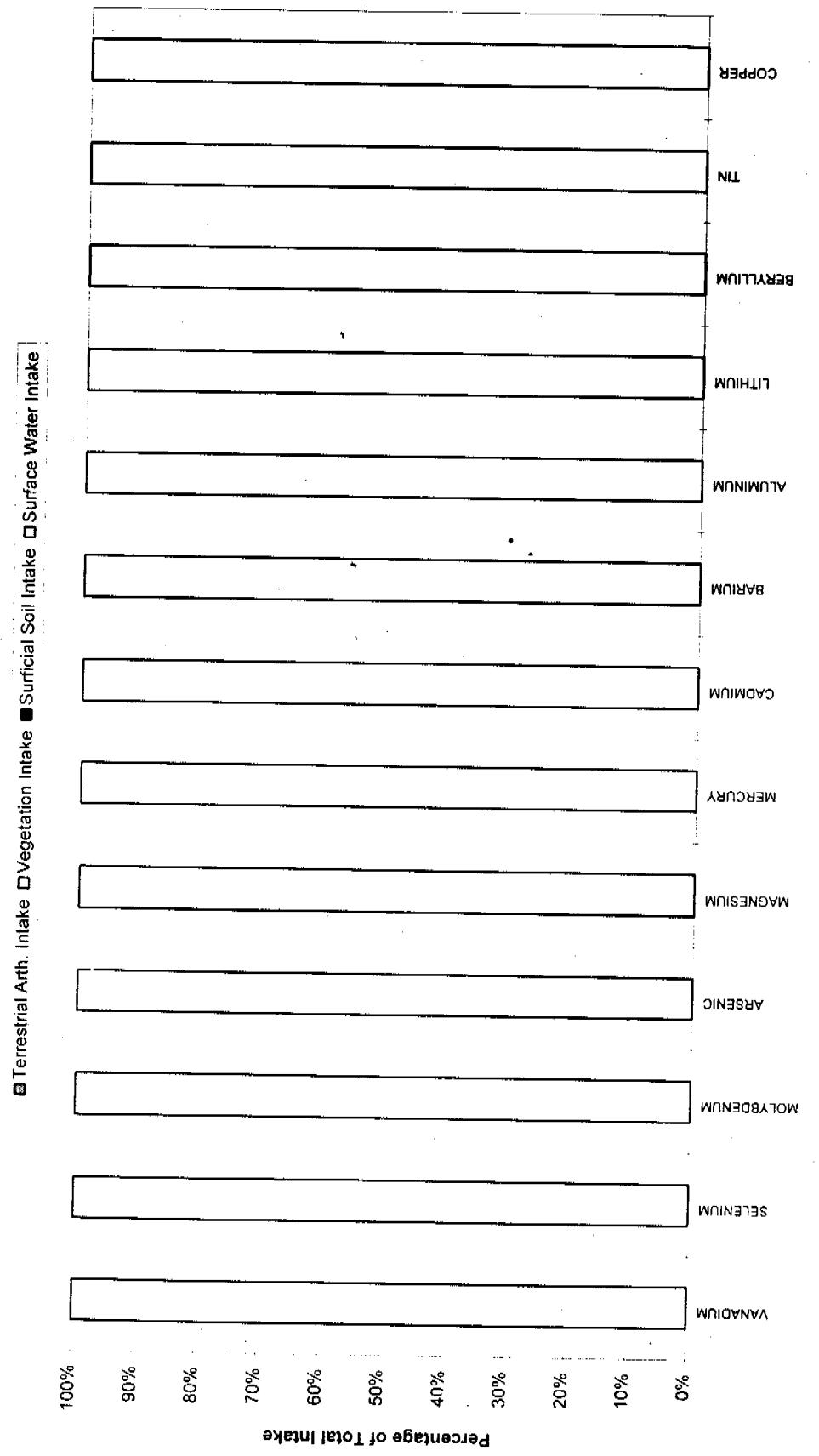


Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU6 Burial Trenches Source Area at RFETS



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU6 Burial Trenches Source Area at RFETS

Contribution of Exposure Points to Total Intake



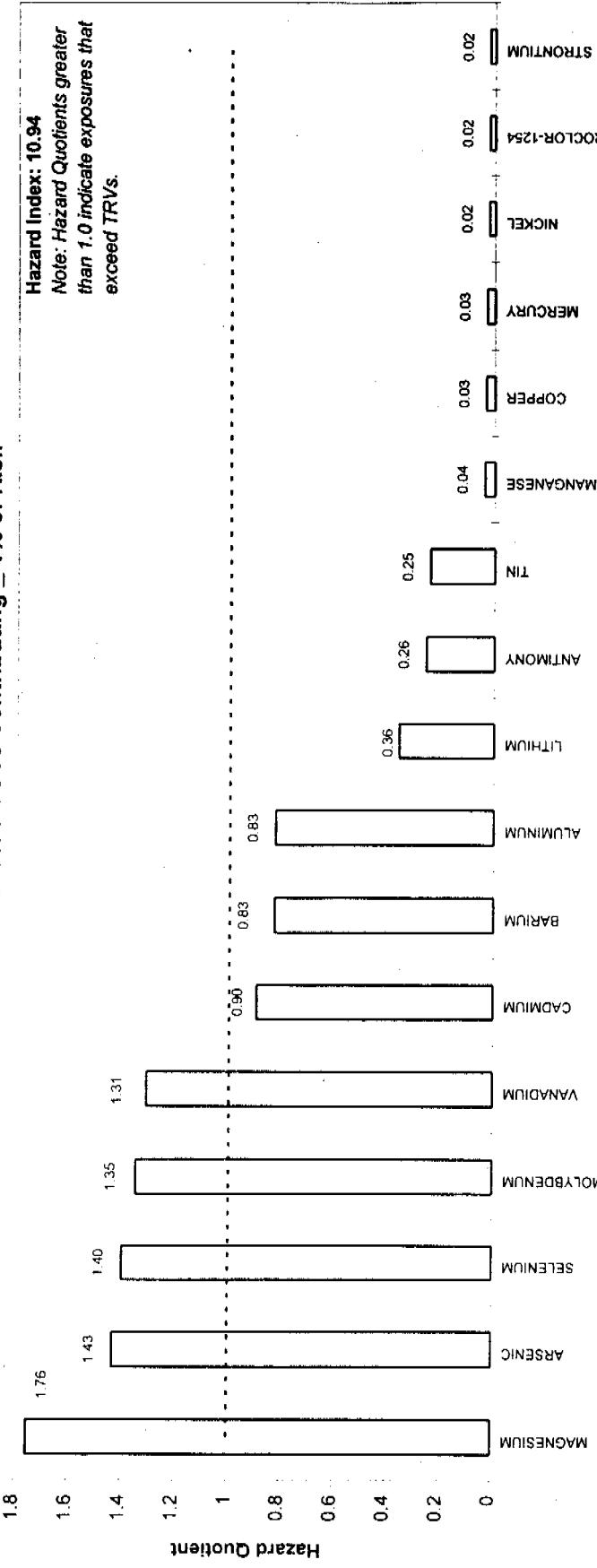
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the OU6 Burial Trenches Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY				
OU6 BURIAL TRENCHES		Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water					
Analyte	PCOC for OU6	UCL ₉₅ SUF = 1.0	IR = NR SUF = 1.0	UCL ₉₅ SUF = 1.0	Intake	Estimated Value	Intake	UCL ₉₅ SUF = 1.0	Intake	UCL ₉₅ SUF = 1.0	Intake	UCL ₉₅ SUF = 1	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
VANADIUM	X	NR	—	19.20	—	3.26	NR	—	NR	—	3.26	—	2.07	1.58	14.17%	
SELENIUM		NR	—	2.58	—	0.44	NR	—	NR	—	0.44	—	0.29	1.52	13.65%	
MOLYBDENUM	X	NR	—	102.91	—	17.50	NR	—	NR	—	17.50	—	11.55	1.51	13.62%	
ARSENIC	X	NR	—	5.13	—	0.87	NR	—	NR	—	0.87	—	0.63	1.38	12.43%	
MAGNESIUM	X	NR	—	1586.86	—	269.77	NR	—	NR	—	269.77	—	244.23	1.10	9.93%	
MERCURY	X	NR	—	0.10	—	0.02	NR	—	NR	—	0.02	—	0.02	1.02	9.21%	
CADMIUM		NR	—	2.40	—	0.41	NR	—	NR	—	0.41	—	0.45	0.91	8.14%	
BARIUM	X	NR	—	48.77	—	8.29	NR	—	NR	—	8.29	—	14.22	0.58	5.24%	
ALUMINUM		NR	—	296.49	—	50.40	NR	—	NR	—	50.40	—	95.89	0.53	4.73%	
LITHIUM		NR	—	49.67	—	8.44	NR	—	NR	—	8.44	—	24.57	0.34	3.09%	
BERYLLIUM		NR	—	2.54	—	0.43	NR	—	NR	—	0.43	—	1.73	0.25	2.24%	
TIN		NR	—	93.84	—	15.95	NR	—	NR	—	15.95	—	65.96	0.24	2.17%	
COPPER		X	NR	—	19.59	3.33	NR	—	NR	—	3.33	43.33	0.08	0.69%		
NICKEL	X	NR	—	17.30	—	2.94	NR	—	NR	—	2.94	—	104.67	0.03	0.25%	
MANGANESE	X	NR	—	21.32	—	3.62	NR	—	NR	—	3.62	—	230.26	0.02	0.14%	
STRONTIUM	X	NR	—	50.06	—	8.51	NR	—	NR	—	8.51	—	688.18	0.01	0.11%	
ZINC		X	NR	—	26.86	4.57	NR	—	NR	—	4.57	—	418.66	0.01	0.10%	
LEAD	X	NR	—	1.18	—	0.20	NR	—	NR	—	0.20	—	20.93	0.01	0.09%	
CHROMIUM	X	NR	—	4.49	0.76	NR	—	NR	—	0.76	7161.75	<0.01	<0.01	<0.01%		

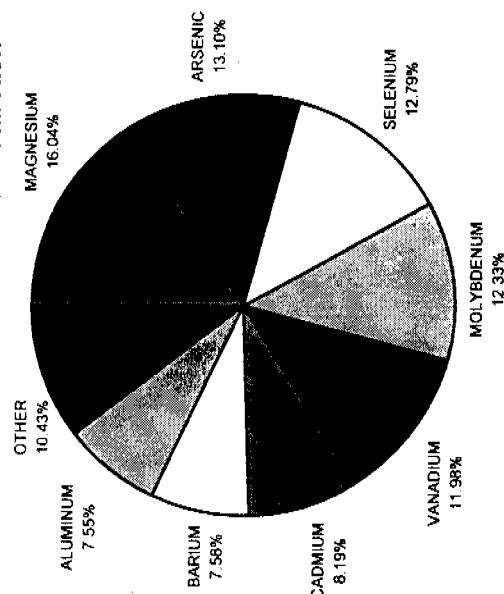
HAZARD INDEX 11.12

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Old Landfill Source Area at RFETTS

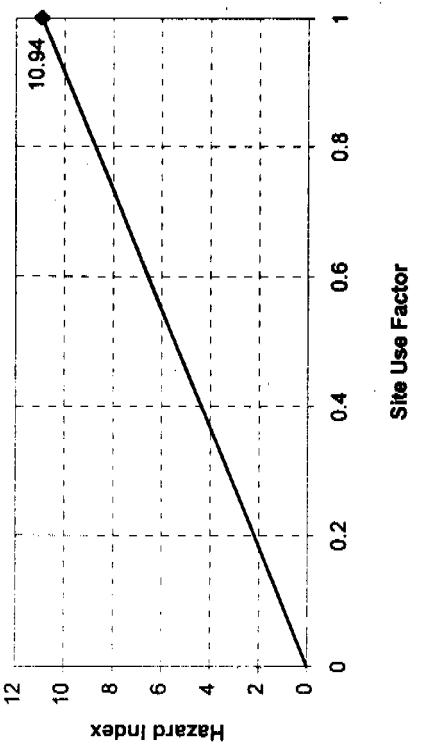
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

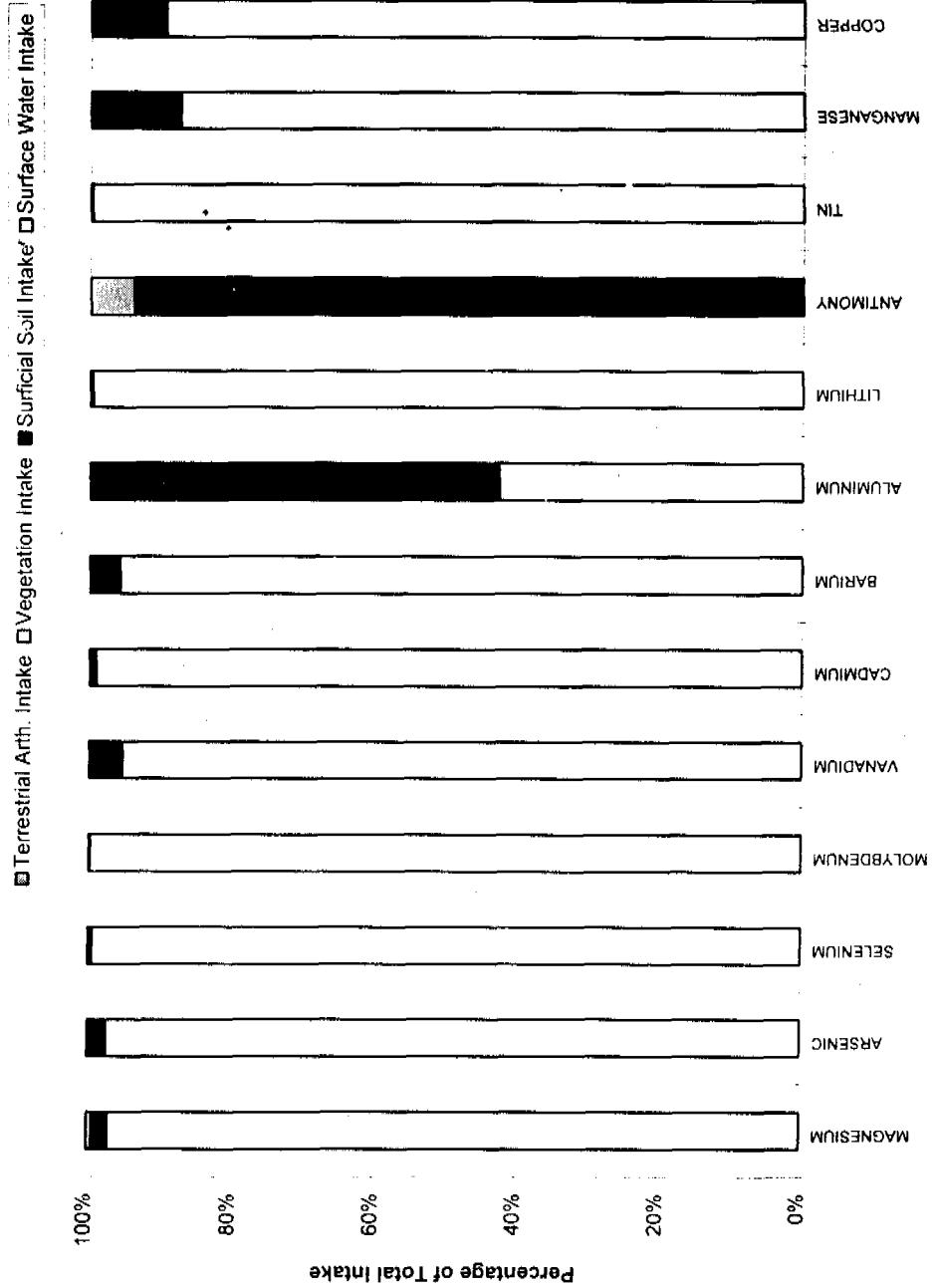


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Old Landfill Source Area at RFETTS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Old Landfill Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE OLD LANDFILL		EXPOSURE POINT										SUMMARY				
		Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
		UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.004/08 SUF = 1.0	IR = 0.15 SUF = 1.0	IR = 0.15 SUF = 1.0	IR = 0.15 SUF = 1.0	IR = 0.15 SUF = 1.0	
MAGNESIUM	PCOC for OUS	IR = NR SUF = 1.0	2448.90	416.31	2298.53	9.38	20.41	3.06	428.75	244.23	1.76	1.76	16.04%			
ARSENIC		NR	—	5.18	0.88	5.70	0.02	2.27E-03	3.40E-04	0.90	0.63	1.43	13.10%			
SELENIUM		NR	—	2.37	0.40	1.87E-03	2.69E-03	4.04E-04	0.40	0.29	1.40	12.79%				
MOLYBDENUM		NR	—	91.51	15.56	7.35	0.03	0.02	3.15E-03	15.59	11.55	1.35	12.33%			
VANADIUM		NR	—	15.23	2.59	30.43	0.12	0.01	1.30E-03	2.71	2.07	1.31	11.98%			
CADMIUM		NR	—	2.35	0.40	0.88	3.59E-03	1.74E-03	2.61E-04	0.40	0.45	0.90	8.19%			
BARIUM	X	NR	—	66.46	11.30	115.59	0.47	0.17	0.02	11.79	14.22	0.83	7.58%			
ALUMINUM		NR	—	199.13	33.85	11074.66	45.18	1.60	0.24	79.28	95.89	0.83	7.55%			
LITHIUM	X	NR	—	52.01	8.84	8.00	0.03	0.01	1.98E-03	8.88	24.57	0.36	3.30%			
ANTIMONY	X	NR	—	ND	—	8.68	0.04	0.02	2.26E-03	0.04	0.14	0.26	2.37%			
TIN		NR	—	95.41	16.22	9.71	0.04	0.02	3.23E-03	16.26	65.96	0.25	2.25%			
MANGANESE		NR	—	47.24	8.03	277.66	1.13	0.06	0.01	9.17	230.26	0.04	0.36%			
COPPER	X	NR	—	7.86	1.34	37.70	0.15	0.01	9.07E-04	1.49	43.33	0.03	0.31%			
MERCURY	X	NR	—	ND	—	0.12	5.05E-04	1.12E-04	1.68E-05	5.22E-04	0.02	0.03	0.28%			
NICKEL		NR	—	14.10	2.40	14.94	0.06	0.01	1.43E-03	2.46	104.67	0.02	0.21%			
AROCLOR-1254	X	NR	—	NR	4.04E-03	6.86E-04	0.57	2.33E-03	ND	—	0.00	0.14	0.02	0.19%		
STRONTIUM	X	NR	—	79.00	13.43	30.81	0.13	0.49	0.07	13.63	688.18	0.02	0.18%			
LEAD	X	NR	—	1.68	0.29	28.70	0.12	4.24E-03	6.37E-04	0.40	20.93	0.02	0.18%			
ZINC	X	NR	—	44.21	7.51	66.57	0.27	0.02	3.10E-03	7.79	418.66	0.02	0.17%			
SILVER	X	NR	—	5.16	0.88	7.18	0.03	3.64E-03	5.47E-04	0.91	58.63	0.02	0.14%			
BENZO(a)PYRENE	X	NR	—	NR	3.47E-02	0.01	2.64	0.01	ND	—	0.02	1.16	0.01	0.13%		
THALLIUM		NR	—	ND	—	0.91	3.71E-03	2.11E-03	3.17E-04	4.03E-03	0.60	0.01	0.06%			
NITRATE/NITRITE		NR	—	NR	0	NR	—	1.49	0.22	0.22	34.67	0.01	0.06%			
DIBENZO(a, h)ANTHRACENE	X	NR	—	NR	0.01	1.05E-03	0.76	3.09E-03	ND	—	4.15E-03	1.16	<0.01	0.03%		
DIEDRIN	X	NR	—	NR	8.62E-04	1.47E-04	0.01	3.77E-05	ND	—	1.84E-04	0.05	<0.01	0.03%		
COBALT	X	NR	—	ND	—	8.35	0.03	0.01	1.23E-03	0.04	13.19	<0.01	0.02%			
BERYLLIUM		NR	—	NR	—	0.88	3.60E-03	9.86E-04	1.48E-04	3.74E-03	1.73	<0.01	0.02%			
BENZO(a)ANTHRACENE	X	NR	—	NR	0.04	0.01	2.85	0.01	ND	—	0.02	11.63	<0.01	0.01%		
BENZO(b)FLUORANTHENE	X	NR	—	NR	0.02	3.34E-03	3.18	0.01	ND	—	0.02	11.63	<0.01	0.01%		
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	3.53E-03	6.00E-04	2.57	0.01	ND	—	0.01	11.63	<0.01	0.01%		
PYRENE	X	NR	—	NR	0.31	0.05	7.09	0.03	ND	—	0.08	87.32	<0.01	0.01%		
BENZO(k)FLUORANTHENE	X	NR	—	NR	0.01	1.22E-03	1.69	0.01	ND	—	0.01	11.63	<0.01	0.01%		
ENDRINKETONE	X	NR	—	NR	NO LOG ₁₀ /ROW ₀	0	0.01	3.82E-05	ND	—	3.82E-05	0.06	<0.01	0.01%		
FLUORANTHENE	X	NR	—	NR	0.31	0.05	8.27	0.03	ND	—	0.09	145.53	<0.01	0.01%		
ENDOSULFAN SULFATE	X	NR	—	NR	2.60E-03	4.41E-04	0.01	3.57E-05	ND	—	4.77E-04	0.91	<0.01	<0.01%		
PENTACHLOROPHENOL	X	NR	—	NR	0	ND	—	0.03	4.02E-03	4.02E-03	7.92	<0.01	<0.01%			
FLUORENE	X	NR	—	NR	0.35	0.06	2.36	0.01	ND	—	0.07	145.53	<0.01	<0.01%		
ACENAPHTHENE	X	NR	—	NR	0.42	0.07	2.64	0.01	ND	—	0.08	203.75	<0.01	<0.01%		
HEPTACHLOR EPOXIDE	X	NR	—	NR	1.29E-03	2.20E-04	4.30E-03	1.76E-05	ND	—	2.38E-04	0.66	<0.01	<0.01%		
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	0.02	4.12E-03	0.30	1.24E-03	0.01	1.36E-03	0.01	21.32	<0.01	<0.01%		
CHRYSENE	X	NR	—	NR	0.07	0.01	2.99	0.01	ND	—	0.02	116.34	<0.01	<0.01%		
NAPHTHALENE	X	NR	—	NR	1.11	0.19	2.50	0.01	ND	—	0.20	1163.43	<0.01	<0.01%		
PHENANTHRENE	X	NR	—	NR	0.91	0.15	9.64	0.04	ND	—	0.19	1163.43	<0.01	<0.01%		

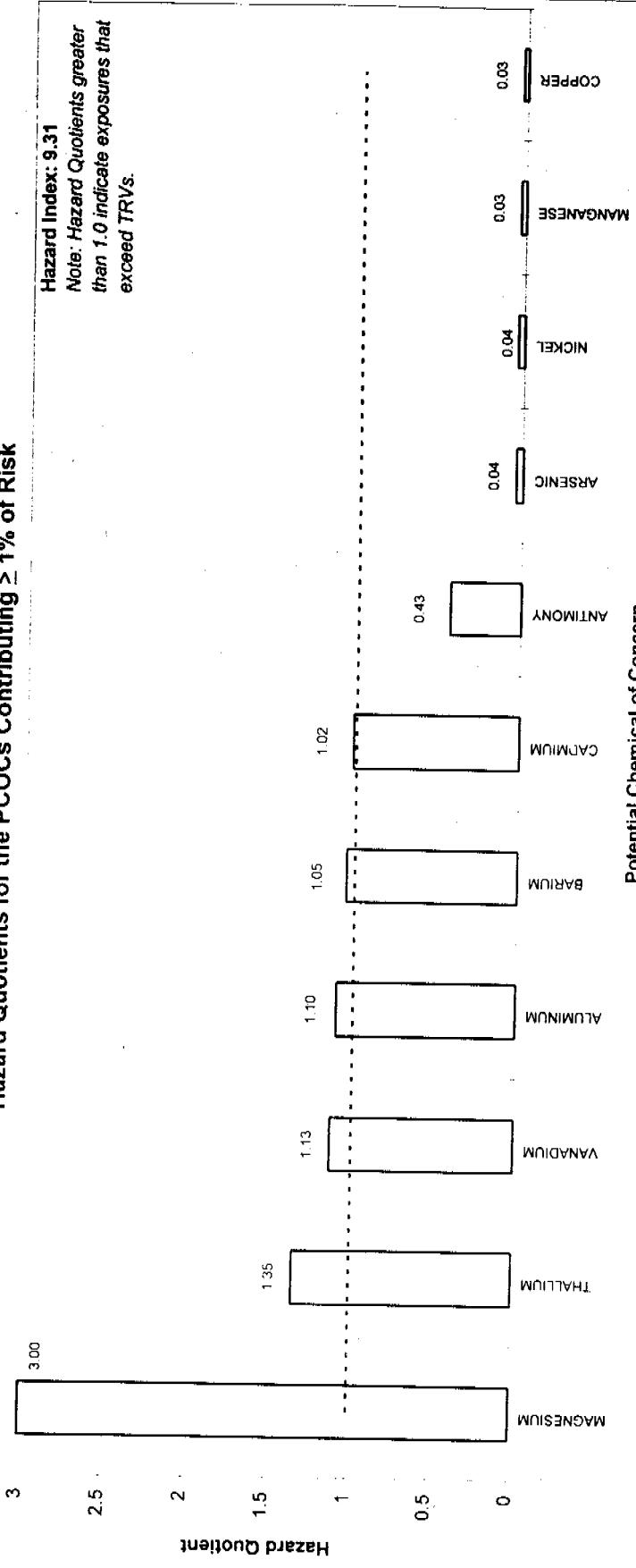
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Old Landfill Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE OLD LANDFILL		EXPOSURE POINT										SUMMARY			
		Terrestrial Arth.		Vegetation				Surficial Soil		Surface Water		Total Intake	Toxicity Value	Hazard Quotient	Percent of Total Risk
		UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.15	Reference Value	Quotient		
ANALYTE	PCOC for OUS	IR = NR SUF = 1.0	NR	—	NR	ND	0	ND	—	0.02	3.60E-03 SUF = 1.0	3.60E-03	26.17	<0.01	<0.01%
ACETONE	X	NR	—	NR	0.01	1.13E-03	0.06	2.45E-04	ND	—	1.38E-03	10.55	<0.01	<0.01%	
METHOXYCHLOR	X	NR	—	NR	4.09	0.70	13.09	0.05	4.51E-03	6.77E-04	0.75	7161.75	<0.01	<0.01%	
CHROMIUM	X	NR	—	NR	1.16E-04	1.97E-05	4.66E-03	1.90E-05	ND	—	3.87E-05	0.52	<0.01	<0.01%	
ALDRIN	X	NR	—	NR	0.02	3.84E-03	0.34	1.38E-03	ND	—	0.01	93.35	<0.01	<0.01%	
BUTYL BENZYL PHthalATE	X	NR	—	NR	0.29	0.05	2.82	0.01	ND	—	0.06	1164.28	<0.01	<0.01%	
ANTHRACENE	X	NR	—	NR	2.81E-03	4.78E-04	0.92	3.76E-03	ND	—	4.24E-03	116.34	<0.01	<0.01%	
BENZO(ghi)PERYLENE	X	NR	—	NR	ND	0	ND	—	3.11E-03	4.67E-04	4.67E-04	15.31	<0.01	<0.01%	
METHYLENE CHLORIDE	X	NR	—	NR	0.15	0.03	0.94	3.85E-03	ND	—	0.03	1163.43	<0.01	<0.01%	
2-METHYLNAPHTHALENE	X	NR	—	NR	8.80E-05	1.50E-05	0.01	3.51E-05	ND	—	5.01E-05	2.09	<0.01	<0.01%	
4,4'-DDT	X	NR	—	NR	0.03	4.70E-03	0.31	1.28E-03	ND	—	0.01	329.81	<0.01	<0.01%	
Di-n-BUTYL PHthalATE	X	NR	—	NR	ND	0	ND	—	2.54E-03	3.81E-04	3.81E-04	39.25	<0.01	<0.01%	
CHLOROFORM	NR	—	—	NR	ND	0	ND	—	2.90E-03	4.36E-04	4.36E-04	171.04	<0.01	<0.01%	
TRICHLOROETHENE	NR	—	—	NR	ND	0	ND	—	0.01	7.62E-04	7.62E-04	409.96	<0.01	<0.01%	
DIETHYL PHthalATE	NR	—	—	NR	ND	0	ND	—	0.33	1.36E-03	ND	—	1.37E-03	1217.65	<0.01
Di-n-OCTYL PHthalATE	X	NR	—	NR	6.20E-05	1.05E-05	0.33	8.48E-04	ND	0.01	8.48E-04	8.48E-04	4672.70	<0.01	<0.01%
2-BUTANONE	NR	—	—	NR	ND	0	ND	—	0.01	8.48E-04	8.48E-04	4672.70	<0.01	<0.01%	

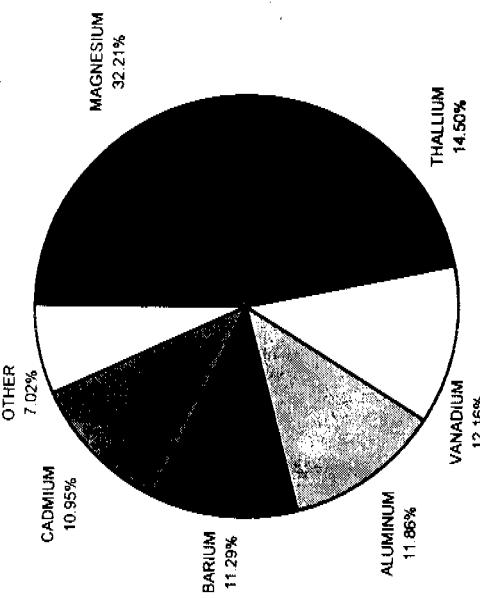
HAZARD INDEX 10.94

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the North Spray Field Source Area at RFETS

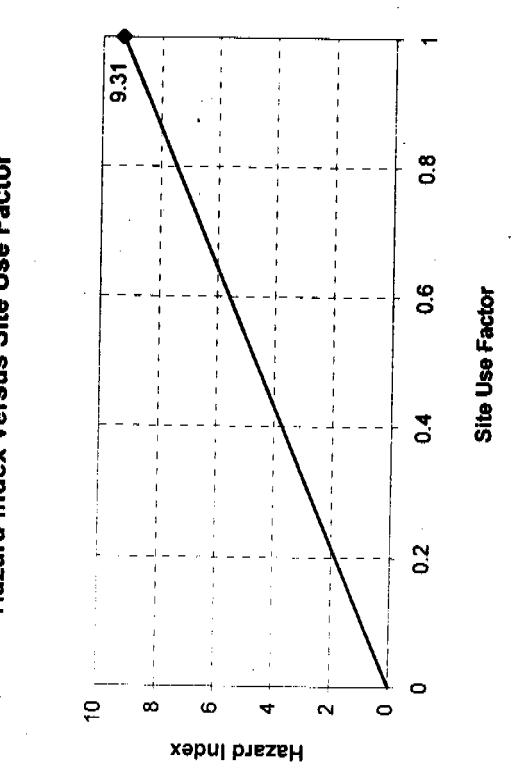
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk



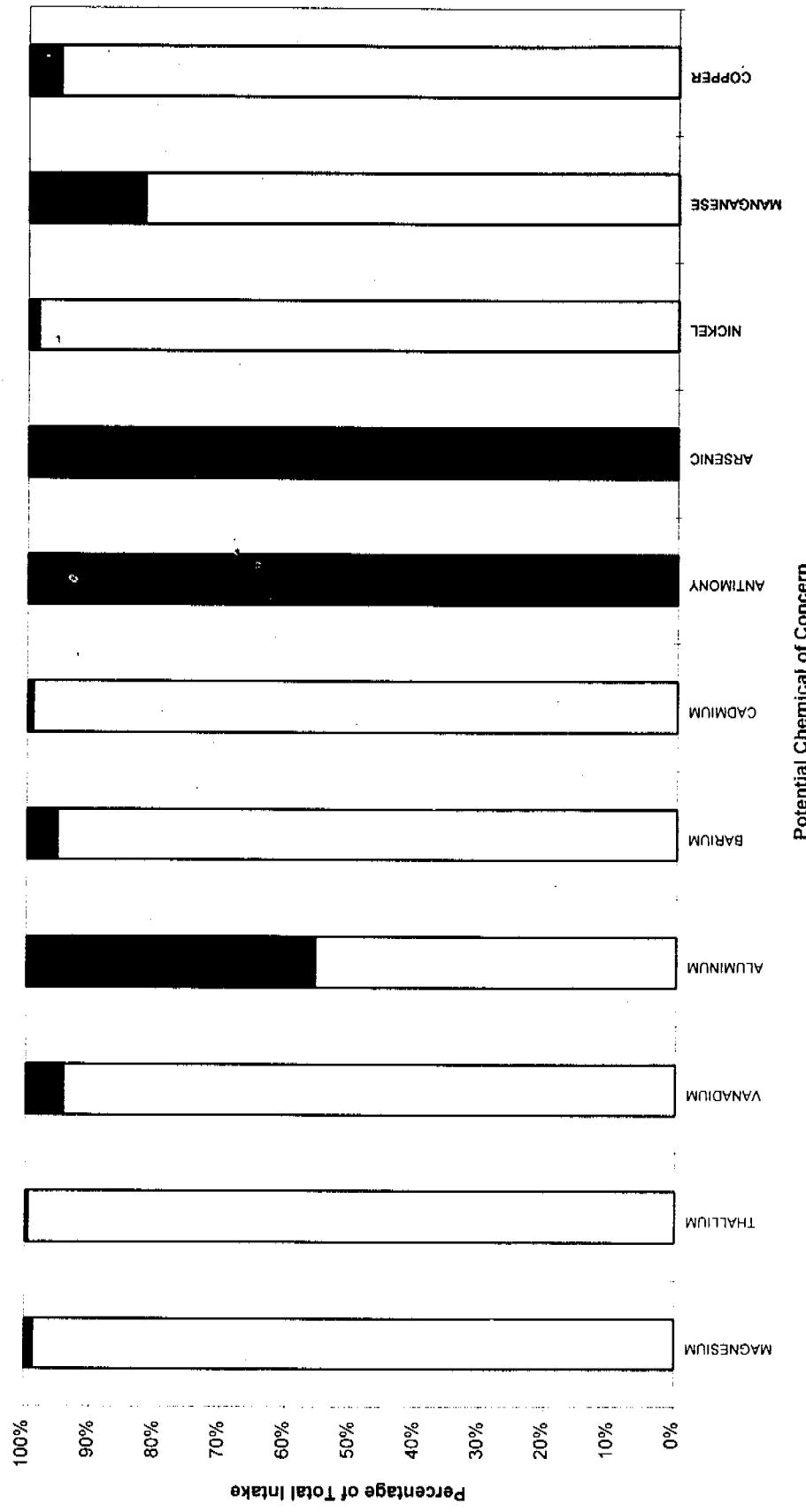
Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the North Spray Field Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Terrestrial Arth. Intake □ Vegetation Intake ■ Superficial Soil Intake □ Surface Water Intake

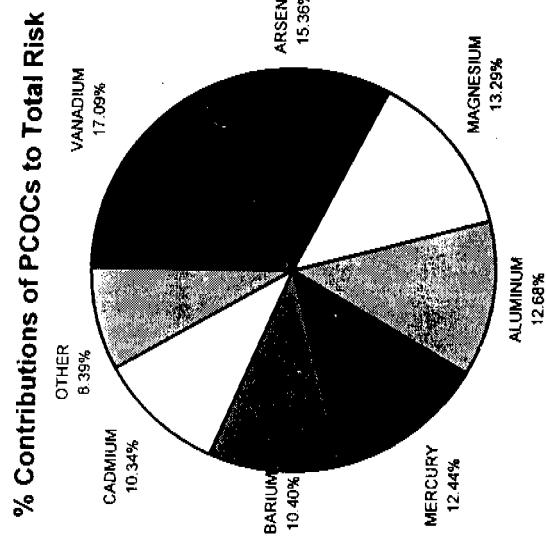
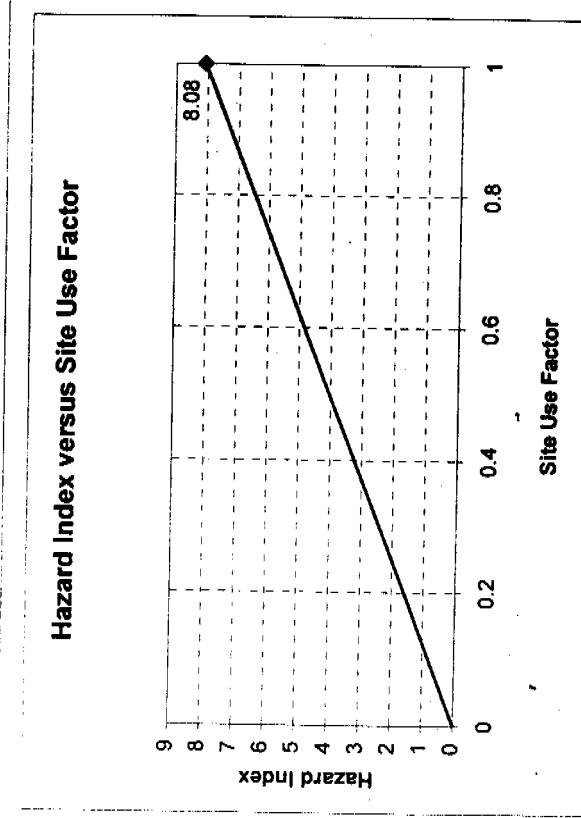
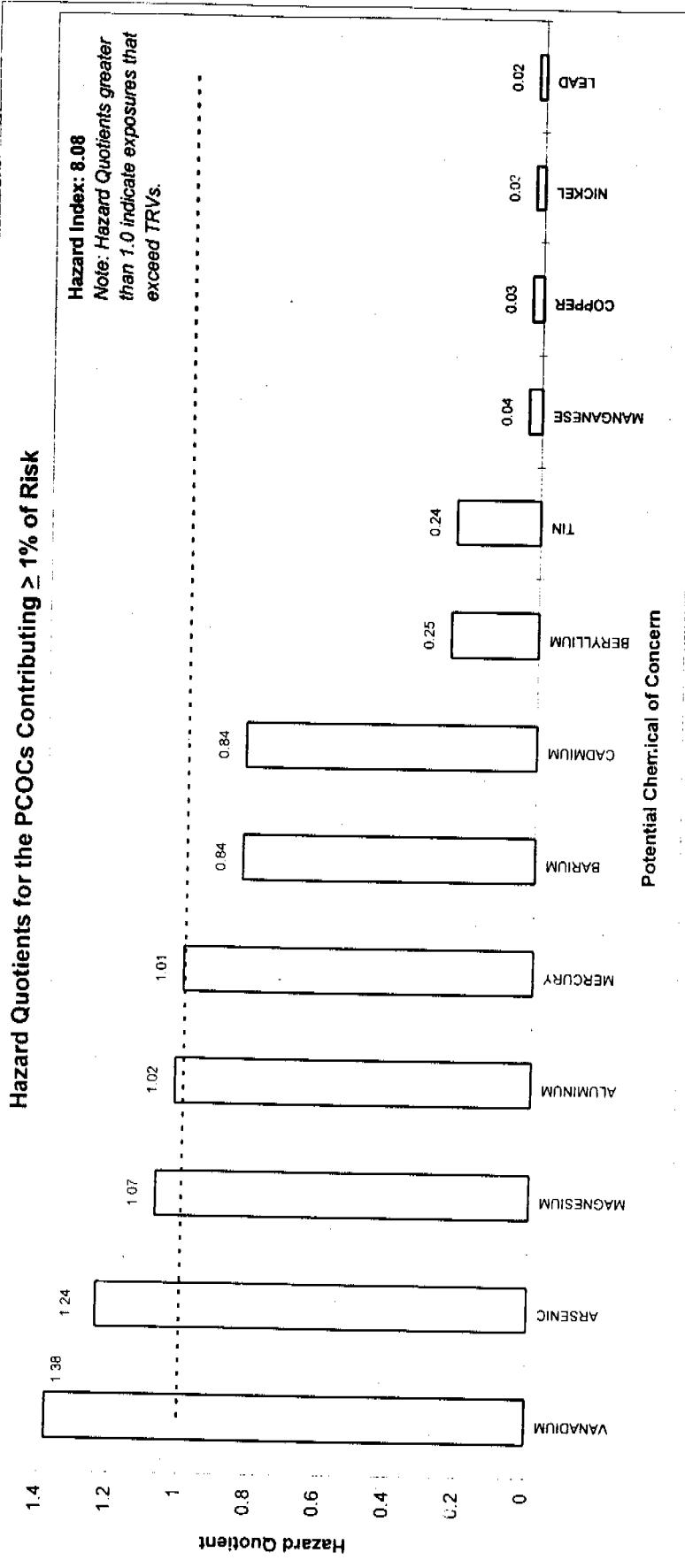


Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the North Spray Field Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE NORTH SPRAY FIELD		EXPOSURE POINT												SUMMARY				
		Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water			Total Intake	Reference Value	Hazard Quotient	Percent of Total Risk	
		UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I SUF = 1					
MAGNESIUM	X	PCOC for OU6	IR = NR SUF = 1.0	IR = 0.17 SUF = 1.0	4253.48	—	723.09	2325.99	9.49	NR	—	732.58	244.23	3.00	32.21%			
THALLIUM	NR	—	4.77	—	0.81	0.93	3.79E-03	NR	—	0.82	0.60	1.35	14.50%					
VANADIUM	X	NR	—	13.00	2.21	33.08	0.13	NR	—	2.34	2.07	1.13	12.16%					
ALUMINUM	NR	—	347.54	—	59.08	11487.90	46.87	NR	—	105.95	95.89	1.10	11.86%					
BARIUM	X	NR	—	83.89	14.26	169.61	0.69	NR	—	14.95	14.22	1.05	11.29%					
CADMIUM	NR	—	2.68	—	0.46	0.99	4.04E-03	NR	—	0.46	0.45	1.02	10.95%					
ANTIMONY	X	NR	—	ND	—	15.43	0.06	NR	—	0.06	0.14	0.43	4.67%					
ARSENIC	X	NR	—	ND	—	6.62	0.03	NR	—	0.03	0.63	0.04	0.46%					
NICKEL	X	NR	—	23.10	3.93	15.06	0.06	NR	—	3.99	104.67	0.04	0.41%					
MANGANESE	X	NR	—	35.25	5.99	319.60	1.30	NR	—	7.30	230.26	0.03	0.34%					
COPPER	X	NR	—	6.54	1.11	14.01	0.06	NR	—	1.17	43.33	0.03	0.29%					
LEAD	X	NR	—	1.76	0.30	40.40	0.16	NR	—	0.46	20.93	0.02	0.24%					
STRONTIUM	X	NR	—	76.34	12.98	31.03	0.13	NR	—	13.10	688.18	0.02	0.20%					
MERCURY	X	NR	—	ND	—	0.07	2.69E-04	NR	—	0.00	0.02	0.02	0.17%					
ZINC	X	NR	—	21.24	3.61	48.93	0.20	NR	—	3.81	418.66	0.01	0.10%					
SELENIUM	NR	—	ND	—	0.58	2.35E-03	NR	—	2.35E-03	0.29	0.01	0.09%						
COBALT	X	NR	—	ND	—	9.70	0.04	NR	—	0.04	13.19	<0.01	0.03%					
BERYLLIUM	NR	—	ND	—	0.63	2.58E-03	NR	—	2.58E-03	1.73	<0.01	0.02%						
LITHIUM	NR	—	ND	—	6.56	0.03	NR	—	0.03	24.57	<0.01	0.01%						
CHROMIUM	X	NR	—	ND	—	12.82	0.05	NR	—	0.05	7161.75	<0.01	<0.01%					

Hazard Index 9.31

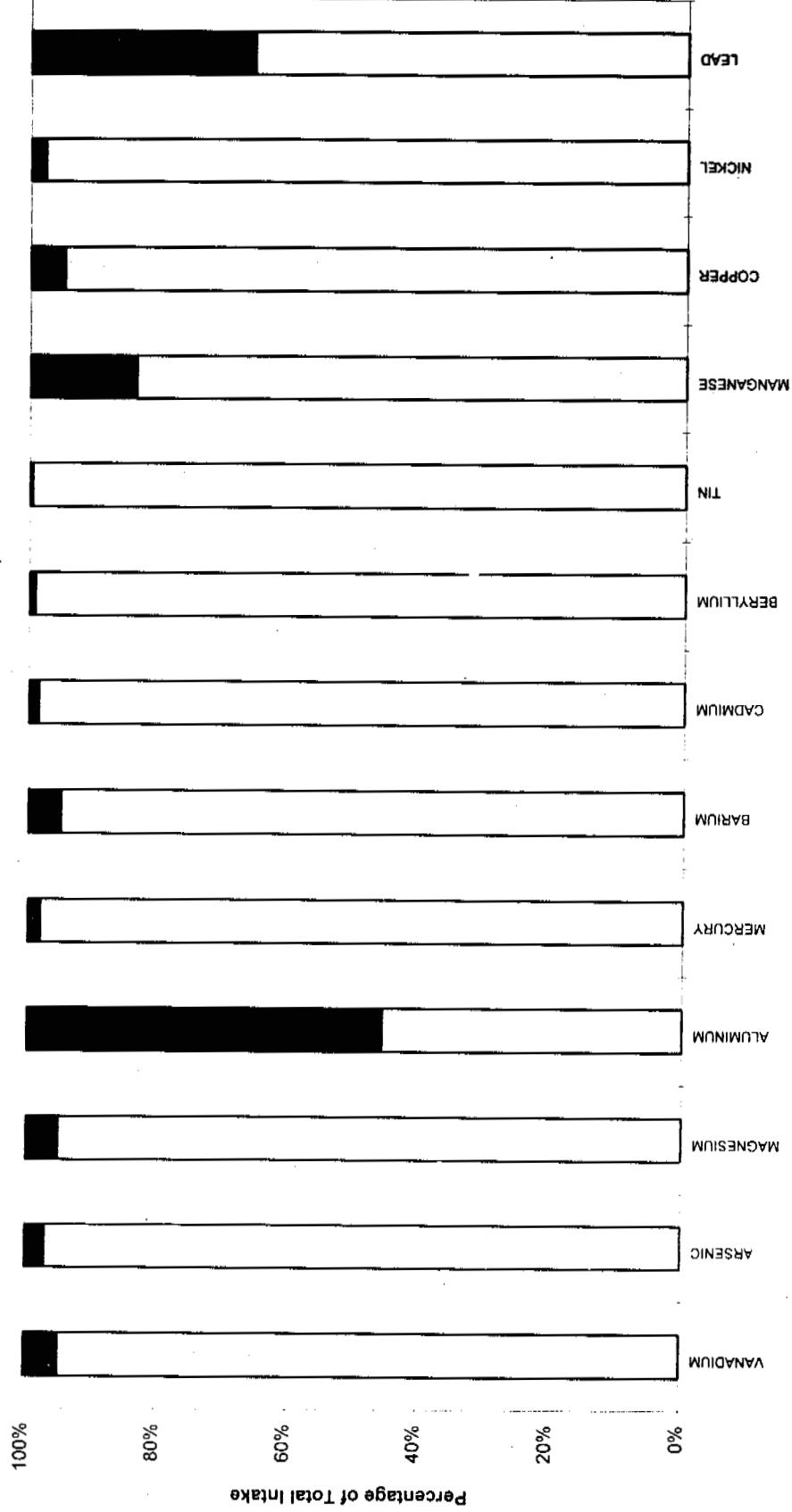
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Ash Pits Source Area at RFETS



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Ash Pits Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Terrestrial Arth. Intake □ Vegetation Intake ■ Surficial Soil Intake □ Surface Water Intake



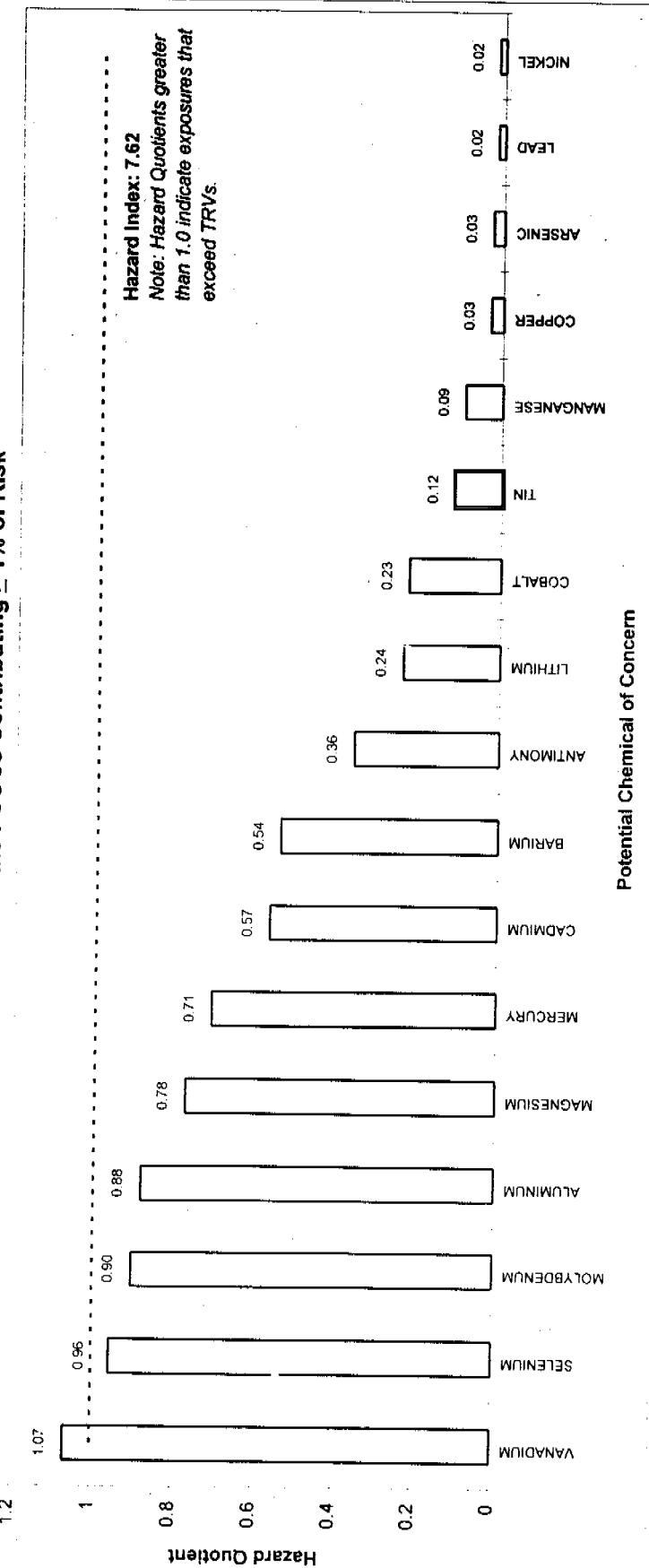
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Ash Pits Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE ASH PITS		EXPOSURE POINT												SUMMARY			
		Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water			Toxicity	Hazard	Percent of Total Risk	
Analyte	PCOC for OUS	IR = NR SUF = 1.0	UCL ₉₅ Intake	IR = 0.17 SUF = 1.0	UCL ₉₅ Value	Estimated Value	Intake	IR = 0.00408 SUF = 1.0	UCL ₉₅ Intake	IR = 0.15 SUF = 1.0	Total Intake	Reference Value	Quotient				
VANADIUM	NR	—	15.94	2.71	36.21	0.15	0.01	1.29E-03	2.86	2.07	1.38	—	—	17.09%			
ARSENIC	NR	—	4.47	0.76	5.72	0.02	2.09E-03	3.13E-04	0.78	0.63	1.24	—	—	15.36%			
MAGNESIUM	NR	—	1466.88	249.37	2929.96	11.95	6.86	1.03	262.35	244.23	1.07	—	—	13.29%			
ALUMINUM	NR	—	264.44	44.95	13038.84	53.20	0.86	0.13	98.28	95.89	1.02	—	—	12.68%			
MERCURY	X	NR	—	0.10	0.02	0.08	3.17E-04	1.10E-04	1.65E-05	0.02	0.02	1.01	—	—	12.44%		
BARIUM	X	NR	—	66.75	11.35	143.89	0.59	0.07	0.01	11.94	14.22	0.84	—	—	10.40%		
CADMIUM	NR	—	2.18	0.37	1.35	0.01	1.49E-03	2.24E-04	0.38	0.45	0.84	—	—	10.34%			
BERYLLOUM	NR	—	2.53	0.43	0.94	3.84E-03	1.37E-03	2.05E-04	0.43	1.73	0.25	—	—	3.11%			
TIN	NR	—	92.82	15.78	16.66	0.07	0.02	3.25E-03	15.85	65.96	0.24	—	—	2.97%			
MANGANESE	NR	—	42.73	7.26	337.52	1.38	0.15	0.02	8.66	230.26	0.04	—	—	0.47%			
COPPER	X	NR	—	7.60	1.29	16.54	0.07	0.01	8.46E-04	1.36	43.33	0.03	—	—	0.39%		
NICKEL	NR	—	14.80	2.52	13.58	0.06	0.01	1.31E-03	2.57	104.67	0.02	—	—	0.30%			
LEAD	X	NR	—	1.58	0.27	33.78	0.14	3.78E-03	5.67E-04	0.41	20.93	0.02	—	—	0.24%		
ANTIMONY	X	NR	—	ND	—	ND	—	0.02	2.30E-03	0.14	0.02	—	—	0.20%			
SILVER	X	NR	—	5.09	0.87	1.81	0.01	3.22E-03	4.83E-04	0.87	58.63	0.01	—	—	0.18%		
ZINC	X	NR	—	29.22	4.97	69.63	0.28	0.02	2.69E-03	5.25	418.66	0.01	—	—	0.16%		
STRONTIUM	X	NR	—	45.07	7.66	38.77	0.16	0.25	0.04	7.86	688.18	0.01	—	—	0.14%		
SELENIUM	NR	—	ND	—	0.41	1.67E-03	1.98E-03	2.97E-04	1.97E-03	0.29	0.01	—	—	0.08%			
THALLIUM	NR	—	ND	—	0.91	3.73E-03	ND	—	3.73E-03	0.60	0.01	—	—	0.08%			
COBALT	X	NR	—	ND	—	8.40	0.03	0.01	1.10E-03	0.04	13.19	<0.01	—	—	0.03%		
LITHIUM	X	NR	—	ND	—	10.38	0.04	0.01	2.24E-03	0.04	24.57	<0.01	—	—	0.02%		
MOLYBDENUM	NR	—	ND	—	0.93	3.78E-03	0.02	2.96E-03	0.01	11.55	<0.01	—	—	0.01%			
NITRATE/NITRITE	NR	—	NR	0	NR	—	0.09	0.01	0.01	34.67	<0.01	—	—	<0.01%			
CHROMIUM	NR	—	4.65	0.79	15.96	0.07	3.90E-03	5.85E-04	0.86	7161.75	<0.01	—	—	<0.01%			
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	—	NR	—	0.01	1.98E-03	1.98E-03	21.32	<0.01	—	—	<0.01%		
ACETONE	NR	—	NR	NR	—	NR	—	0.01	1.34E-03	1.34E-03	26.17	<0.01	—	—	<0.01%		
METHYLENE CHLORIDE	X	NR	—	NR	NR	—	0.01	4.74E-03	7.11E-04	7.11E-04	15.31	<0.01	—	—	<0.01%		
CARBON DISULFIDE	NR	—	NR	NR	—	NR	—	2.74E-03	4.10E-04	4.10E-04	29.02	<0.01	—	—	<0.01%		
1,2-DICHLOROETHANE	NR	—	NR	NR	—	NR	—	3.07E-03	4.61E-04	4.61E-04	61.19	<0.01	—	—	<0.01%		
DIETHYL PHTHALATE	NR	—	NR	—	NR	—	0.01	7.98E-04	7.98E-04	7.98E-04	409.96	<0.01	—	—	<0.01%		

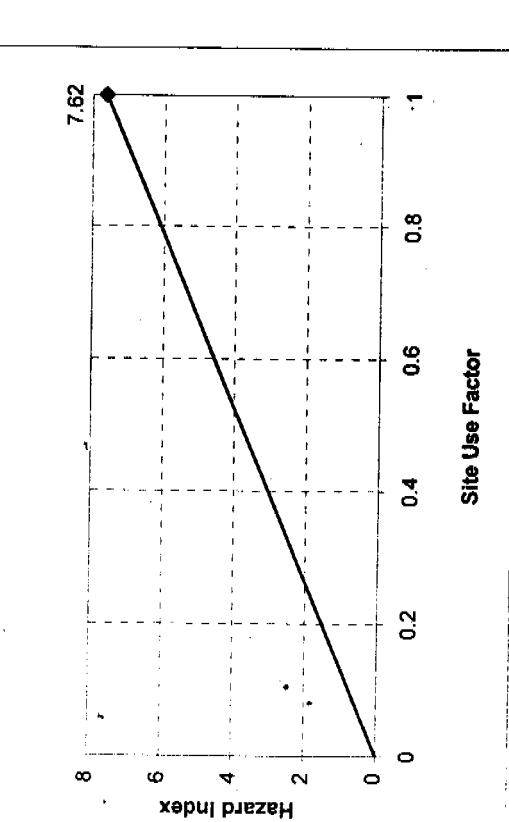
HAZARD INDEX 8.08

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 903 Pad Source Area at RFETS

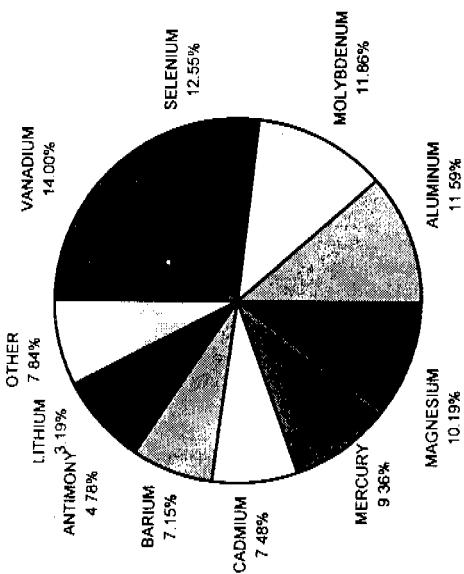
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



Hazard Index versus Site Use Factor

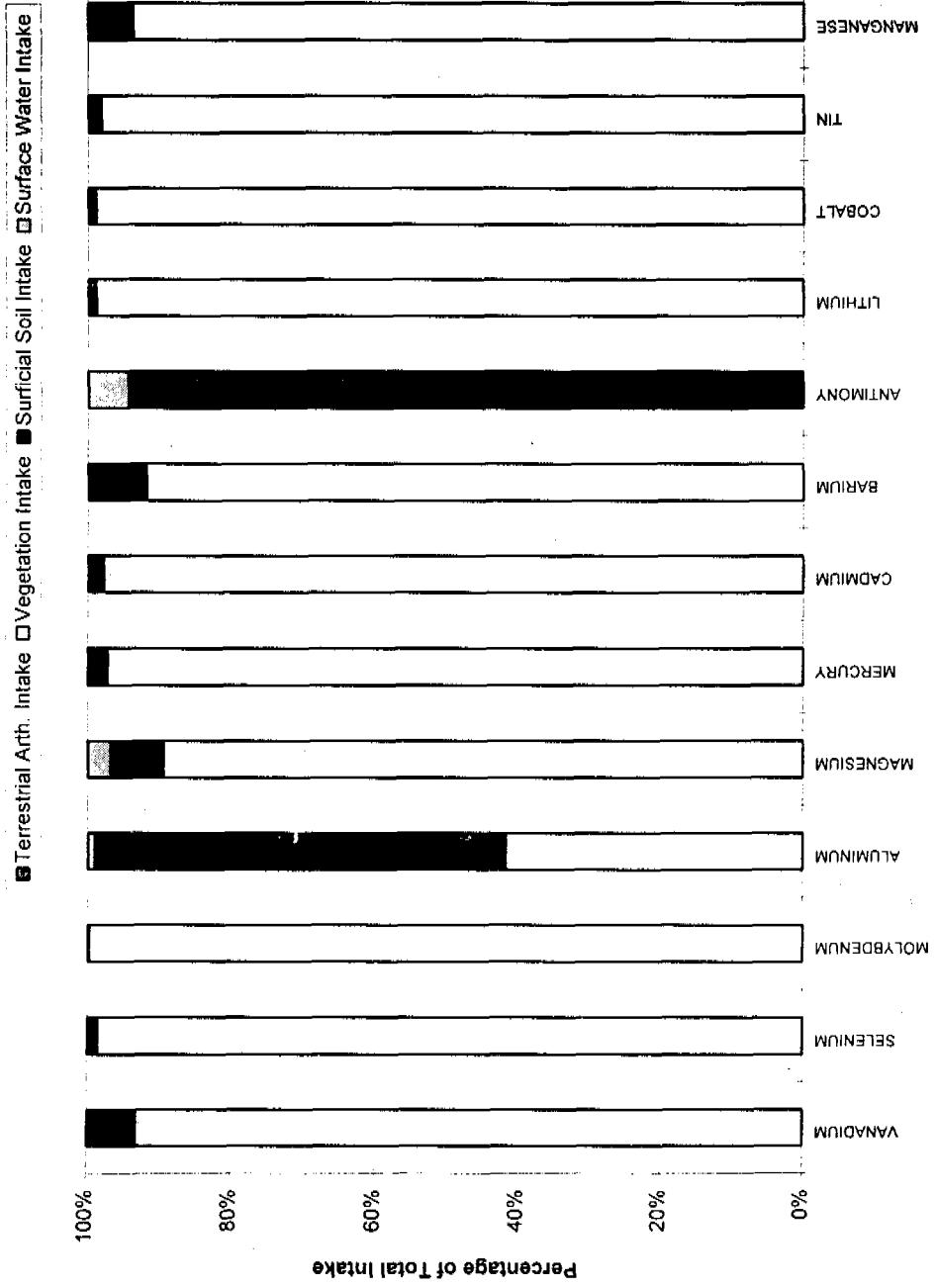


% Contributions of PCOCs to Total Risk



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 903 Pad Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 903 Pad Source Area at RFETS

EXPOSURE POINT												SUMMARY			
Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte ¹	PCOC for OU2	IR = 0.05	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.15	SUF = 1.0	SUF = 1.0	SUF = 1.0
VANADIUM	—	IR = 0.119	SUF = 1.0	—	17.31	2.06	35.68	0.15	0.03	3.95E-03	2.21	2.07	1.07	14.00%	
SELENIUM	NR	—	ND	2.29	0.27	0.68	2.77E-03	0.01	1.22E-03	0.28	0.29	0.96	0.96	12.55%	
MOLYBDENUM	NR	—	87.52	10.41	4.98	0.02	0.02	3.63E-03	10.44	11.55	0.90	0.90	11.86%		
ALUMINUM	NR	—	297.17	35.36	11886.18	48.50	5.48	0.82	84.68	95.89	0.88	0.88	11.59%		
MAGNESIUM	NR	—	1426.04	169.70	3426.35	13.98	39.93	5.99	189.67	244.23	0.78	0.78	10.19%		
MERCURY	ND	—	0.10	0.01	0.08	3.10E-04	0.00	1.71E-05	0.01	0.02	0.71	0.71	9.36%		
CADMIUM	ND	—	2.11	0.25	1.29	0.01	2.30E-03	3.45E-04	0.26	0.45	0.57	0.57	7.48%		
BARIUM	NR	—	59.79	7.12	143.68	0.59	0.26	0.04	7.74	14.22	0.54	0.54	7.15%		
ANTIMONY	NR	—	ND	—	—	12.20	0.05	0.02	2.96E-03	0.05	0.14	0.36	0.36	4.78%	
LITHIUM	NR	—	49.67	5.91	13.59	0.06	0.07	0.01	5.98	24.57	0.24	0.24	3.19%		
COBALT	NR	—	25.37	3.02	7.67	0.03	0.01	1.79E-03	3.05	13.19	0.23	0.23	3.04%		
TIN	NR	—	64.48	7.67	33.32	0.14	0.05	0.01	7.82	65.96	0.12	0.12	1.56%		
MANGANESE	NR	—	170.00	20.23	318.24	1.30	0.31	0.05	21.57	230.26	0.09	0.09	1.23%		
COPPER	NC	—	10.42	1.24	21.82	0.09	0.02	3.61E-03	1.33	43.33	0.03	0.03	0.40%		
ARSENIC	NR	—	ND	—	4.00	0.02	0.01	8.31E-04	0.02	0.63	0.03	0.03	0.36%		
LEAD	X	—	1.79	0.21	32.37	0.13	0.01	9.97E-04	0.35	20.93	0.02	0.02	0.22%		
NICKEL	NR	—	12.60	1.50	26.99	0.11	0.01	2.13E-03	1.61	104.67	0.02	0.02	0.20%		
SILVER	ND	—	5.59	0.67	ND	—	4.50E-03	6.75E-04	0.67	58.63	0.01	0.01	0.15%		
AROCLOR-1254	X	NR	—	NR	1.47E-03	1.75E-04	0.21	8.50E-04	1.88E-03	2.82E-04	1.31E-03	0.14	0.01	0.12%	
ZINC	NC	—	29.15	3.47	72.70	0.30	0.23	0.03	3.80	418.66	0.01	0.01	0.12%		
STRONTIUM	NR	—	46.85	5.58	43.04	0.18	1.03	0.15	5.91	688.18	0.01	0.01	0.11%		
AROCLOR-1248	NR	—	NR	2.41E-03	2.86E-04	0.21	8.62E-04	ND	—	1.15E-03	0.14	0.01	0.01	0.11%	
THALLIUM	NR	—	ND	—	0.87	3.53E-03	ND	—	3.53E-03	0.60	0.01	0.01	0.08%		
NITRATE/NITRITE	NR	—	NR	0	3.11	0.01	0.79	0.12	0.13	34.67	<0.01	<0.01	0.05%		
BERYLLIUM	NR	—	ND	—	1.29	0.01	1.26E-03	1.89E-04	0.01	1.73	<0.01	<0.01	0.04%		
BENZO(a)PYRENE	X	NR	—	NR	4.23E-03	5.03E-04	0.32	1.31E-03	ND	—	1.81E-03	1.16	<0.01	0.02%	
CHROMIUM	X	131.00	6.55	5.51	0.66	26.79	0.11	0.01	1.70E-03	7.32	7161.75	<0.01	0.01%		
DIBENZ(a,h)ANTHRACENE	NR	—	NR	1.46E-03	1.74E-04	0.18	7.31E-04	ND	—	9.05E-04	1.16	<0.01	0.01%		
BENZO(a)ANTHRACENE	X	NR	—	NR	0.01	5.99E-04	0.33	1.36E-03	ND	—	1.96E-03	11.63	<0.01	<0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	0.02	2.35E-03	0.25	1.01E-03	ND	—	3.36E-03	21.32	<0.01	<0.01%	
BENZO(b)FLUORANTHENE	X	NR	—	NR	2.08E-03	2.47E-04	0.34	1.37E-03	ND	—	1.62E-03	11.63	<0.01	<0.01%	
BENZO(k)FLUORANTHENE	X	NR	—	NR	1.32E-03	1.57E-04	0.31	1.27E-03	ND	—	1.43E-03	11.63	<0.01	<0.01%	
1,2-DICHLOROETHENE	NR	—	NR	NR	—	NR	—	0.01	1.72E-03	1.72E-03	19.79	<0.01	<0.01	<0.01%	
ACETONE	NR	—	NR	NR	—	NR	—	0.01	1.97E-03	1.97E-03	26.17	<0.01	<0.01	<0.01%	
PYRENE	X	NR	—	NR	0.03	3.39E-03	0.64	2.63E-03	ND	—	0.01	87.32	<0.01	<0.01%	
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	2.58E-04	3.07E-05	0.19	7.67E-04	ND	—	7.97E-04	11.63	<0.01	<0.01%	
TETRACHLOROETHENE	NR	—	NR	NR	—	NR	—	0.01	9.43E-04	9.43E-04	16.30	<0.01	<0.01	<0.01%	
CHLOROFORM	NR	—	NR	NR	—	NR	—	0.01	1.62E-03	1.62E-03	39.25	<0.01	<0.01	<0.01%	
FLUORANTHENE	X	NR	—	NR	0.03	3.05E-03	0.69	2.81E-03	ND	—	0.01	145.53	<0.01	<0.01%	
METHYLENE CHLORIDE	NR	—	NR	NR	—	NR	—	3.71E-03	5.57E-04	5.57E-04	15.31	<0.01	<0.01	<0.01%	
BENZYL ALCOHOL	NR	—	NR	ND	0	ND	—	0.01	8.01E-04	8.01E-04	27.31	<0.01	<0.01	<0.01%	
FLUORENE	NR	—	NR	0.03	3.35E-03	0.19	7.74E-04	ND	—	4.13E-03	145.53	<0.01	<0.01	<0.01%	
ACENAPHTHENE	NR	—	NR	0.03	3.52E-03	0.19	7.60E-04	ND	—	4.28E-03	203.75	<0.01	<0.01	<0.01%	

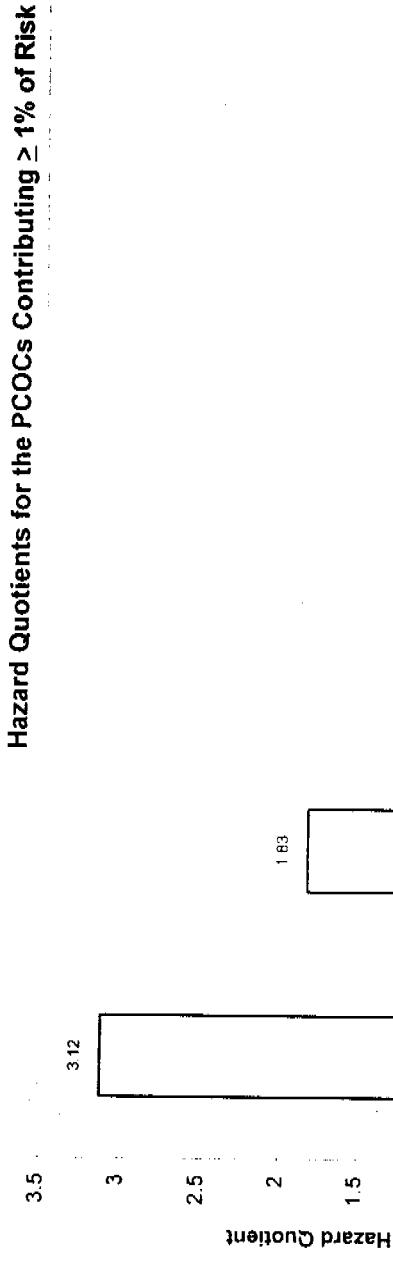
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 903 Pad Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY			
903 PAD		Terrestrial Arth.		Vegetation		Surficial Soil		Surface Water		Total Intake		Toxicity	Hazard Quotient	Percent of Total Risk	
Analyte ¹	PCOC for OU2	UCL ₉₅ IR = 0.05 SUF = 1.0	Intake IR = 0.119 SUF = 1.0	UCL ₉₅ IR = 0.119 SUF = 1.0	Estimated Value	Intake IR = 0.00408 SUF = 1.0	UCL ₉₅ IR = 0.00408 SUF = 1.0	Intake IR = 0.15 SUF = 1.0	UCL ₉₅ IR = 0.15 SUF = 1.0	Intake IR = 0.15 SUF = 1.0	Reference Value				
CHRYSENE	X	NR	—	NR	0.01	8.98E-04	0.34	1.39E-03	ND	—	2.29E-03	116.34	<0.01	<0.01%	
Di-n-BUTYL PHTHALATE	X	NR	—	NR	0.03	3.72E-03	0.35	1.44E-03	0.01	9.02E-04	0.01	329.81	<0.01	<0.01%	
CARBON DISULFIDE		NR	—	NR	NR	—	NR	—	2.84E-03	4.26E-04	4.26E-04	29.02	<0.01	<0.01%	
TRICHLOROETHENE		NR	—	NR	NR	—	NR	—	0.01	1.84E-03	1.84E-03	171.04	<0.01	<0.01%	
PHENANTHRENE	X	NR	—	NR	0.05	0.01	0.56	2.27E-03	ND	—	0.01	1163.43	<0.01	<0.01%	
BENZO(ghi)PERYLENE	X	NR	—	NR	5.83E-04	6.94E-05	0.19	7.80E-04	ND	—	0.01	116.34	<0.01	<0.01%	
ANTHRACENE		NR	—	NR	0.02	2.48E-03	0.20	8.18E-04	ND	—	3.29E-03	1164.28	<0.01	<0.01%	

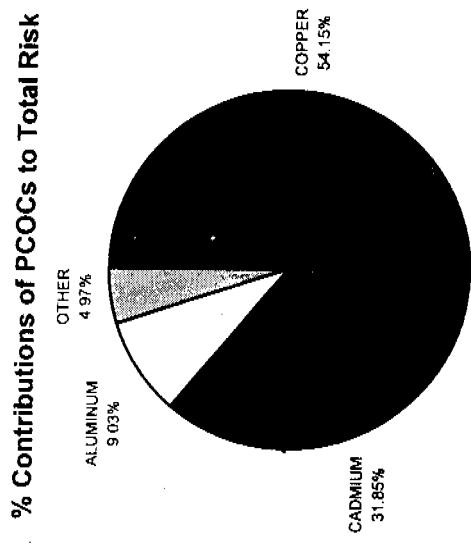
¹ Chromium concentrations in terrestrial arthropods estimated from tissue:soil ratios in East Trenches source area.

HAZARD INDEX 7.62

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the East Trencher, Source Area at RFETS

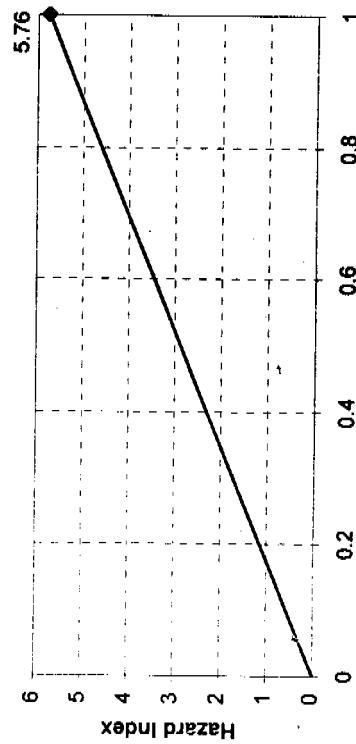


Hazard Index: 5.76
Note: Hazard Quotients greater than 1.0 indicate exposures that exceed TRVs.



Potential Chemical of Concern

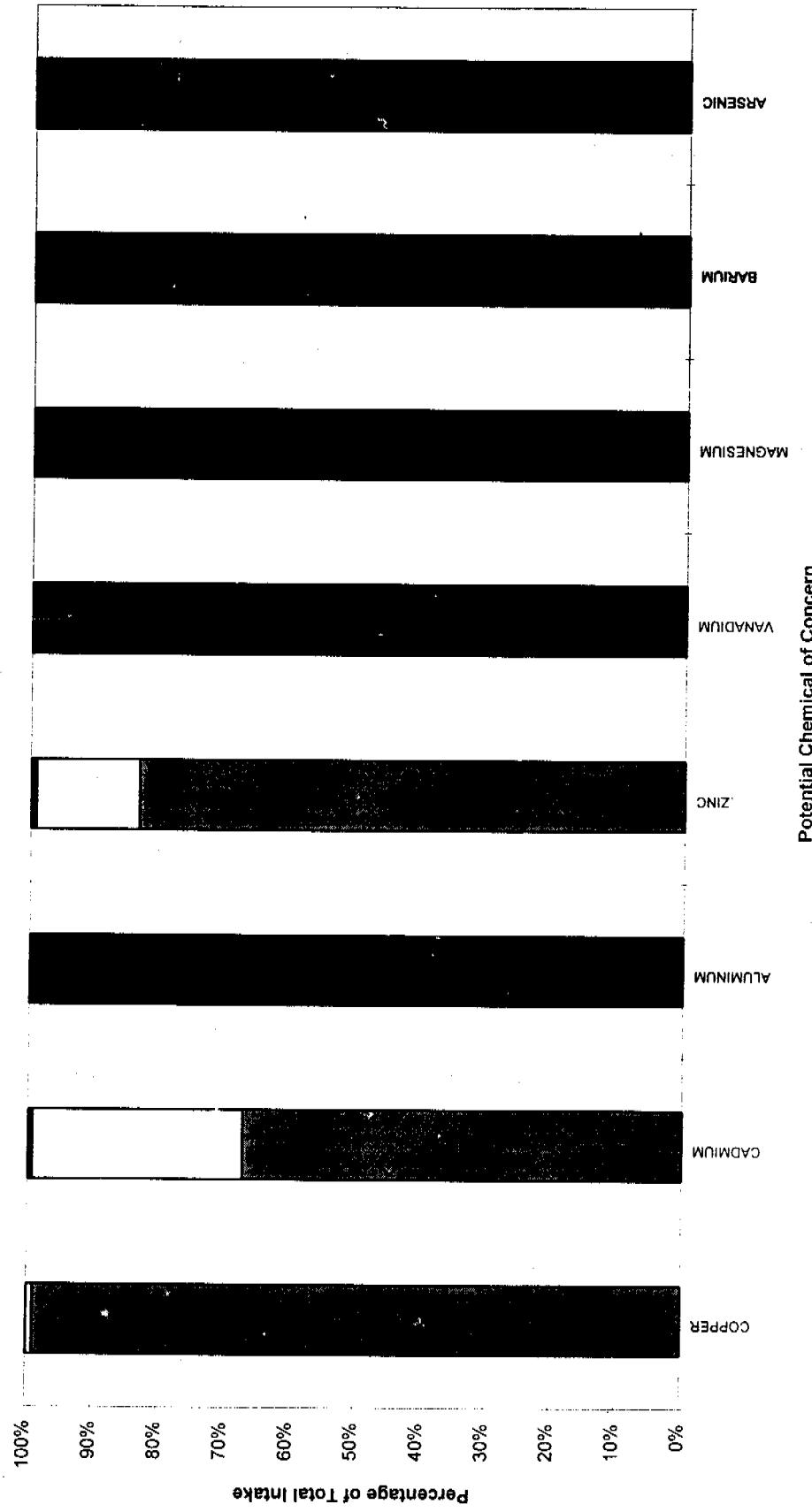
Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the East Trenches Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Terrestrial Arth. Intake □ Vegetation Intake ■ Surficial Soil Intake □ Surface Water Intake



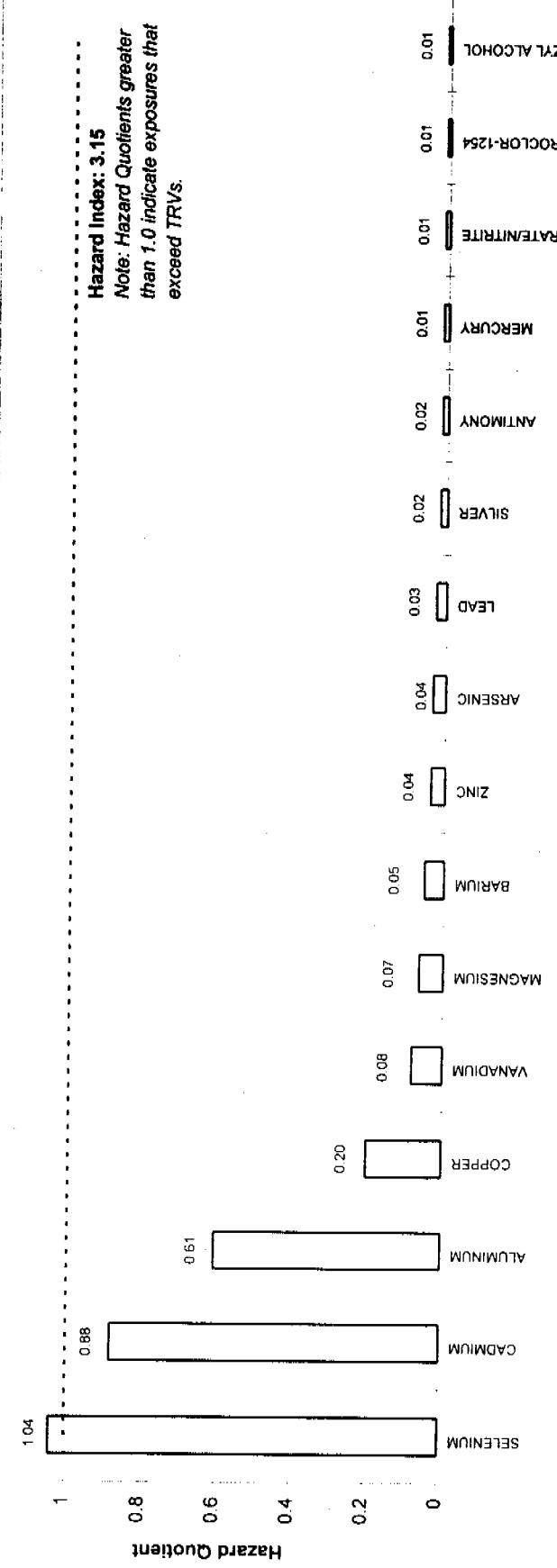
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the East Trenches Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE EAST TRENCHES		EXPOSURE POINT										SUMMARY			
		Terrestrial Arth.		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
Analyte	PCOC for OU2	UCI ₉₅ IR = 0.05 SUF = 1.0	UCI ₉₅ IR = 0.119 SUF = 1.0	UCI ₉₅ IR = 0.00408 SUF = 1.0	UCI ₉₅ IR = 1 SUF = 1	UCI ₉₅ IR = 1 SUF = 1	UCI ₉₅ IR = 1 SUF = 1	Intake	Intake	Intake	Intake	Intake	Intake		
COPPER	2676.87	133.84	10.43	1.24	13.08	0.05	NR	—	135.14	43.33	3.12	54.15%			
CADMIUM	11.13	0.56	2.22	0.26	1.44	0.01	NR	—	0.83	0.45	1.83	31.85%			
ALUMINUM	NR	—	NR	0	12216.91	49.85	NR	—	49.85	95.89	0.52	9.03%			
ZINC	429.34	21.47	33.84	4.03	54.00	0.22	NR	—	25.71	418.66	0.06	1.07%			
VANADIUM	NR	—	NR	0	27.79	0.11	NR	—	0.11	2.07	0.05	0.95%			
MAGNESIUM	NR	—	NR	0	2431.74	9.92	NR	—	9.92	244.23	0.04	0.71%			
BARIUM	NR	—	NR	0	126.84	0.53	NR	—	0.53	14.22	0.04	0.64%			
ARSENIC	NR	—	NR	0	5.50	0.02	NR	—	0.02	0.63	0.04	0.62%			
LEAD	X	ND	1.51	0.18	45.99	0.19	NR	—	0.37	20.93	0.02	0.30%			
SILVER	ND	—	5.10	0.61	3.59	0.01	NR	—	0.62	58.63	0.01	0.18%			
SELENIUM	ND	—	ND	—	0.73	3.00E-03	NR	—	3.00E-03	0.29	0.01	0.18%			
MANGANESE	NR	—	NR	0	310.49	1.27	NR	—	1.27	230.26	0.01	0.10%			
BERYLLIUM	NR	—	NR	0	1.56	0.01	NR	—	0.01	1.73	<0.01	0.06%			
COBALT	NR	—	NR	0	7.14	0.03	NR	—	0.03	13.19	<0.01	0.04%			
LITHIUM	NR	—	NR	0	13.27	0.05	NR	—	0.05	24.57	<0.01	0.04%			
TIN	NR	—	NR	0	34.19	0.14	NR	—	0.14	65.96	<0.01	0.04%			
BENZO(a)PYRENE	X	NR	—	NR	2.76E-03	3.29E-04	0.21	8.55E-04	NR	—	1.16	<0.01	0.02%		
CHROMIUM	X	63.48	3.17	7.23	0.86	12.98	0.05	NR	—	4.09	7161.75	<0.01	0.01%		
NICKEL	NR	—	NR	0	11.63	0.05	NR	—	0.05	104.67	<0.01	0.01%			
STRONTIUM	NR	—	NR	0	34.85	0.14	NR	—	0.14	688.18	<0.01	<0.01%			
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	0.02	2.09E-03	0.22	9.00E-04	NR	—	2.99E-03	21.32	<0.01		
BENZO(a)ANTHRACENE	X	NR	—	NR	3.18E-03	3.79E-04	0.21	8.63E-04	NR	—	1.24E-03	11.63	<0.01		
BENZO(b)FLUORANTHENE	X	NR	—	NR	1.23E-03	1.46E-04	0.20	8.10E-04	NR	—	9.56E-04	11.63	<0.01		
PYRENE	X	NR	—	NR	0.01	1.15E-03	0.22	8.91E-04	NR	—	2.04E-03	87.32	<0.01		
FLUORANTHENE	X	NR	—	NR	0.01	1.01E-03	0.23	9.34E-04	NR	—	1.95E-03	145.53	<0.01		
CHRYSENE	X	NR	—	NR	4.22E-03	5.02E-04	0.19	7.77E-04	NR	—	1.28E-03	116.34	<0.01		
PHENANTHRENE	X	NR	—	NR	0.02	2.34E-03	0.21	8.50E-04	NR	—	3.19E-03	1163.43	<0.01		

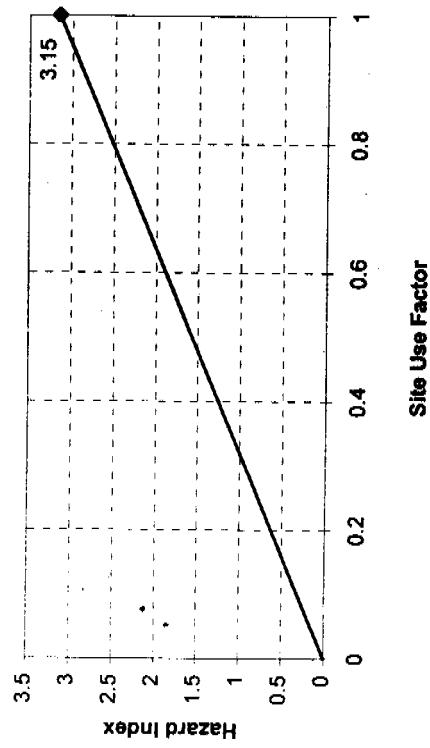
HAZARD INDEX 5.76

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 881 Hillside Source Area at RFETs

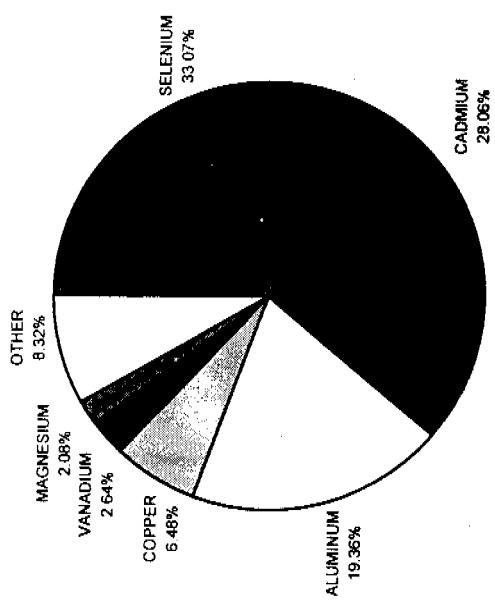
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



Hazard Index versus Site Use Factor

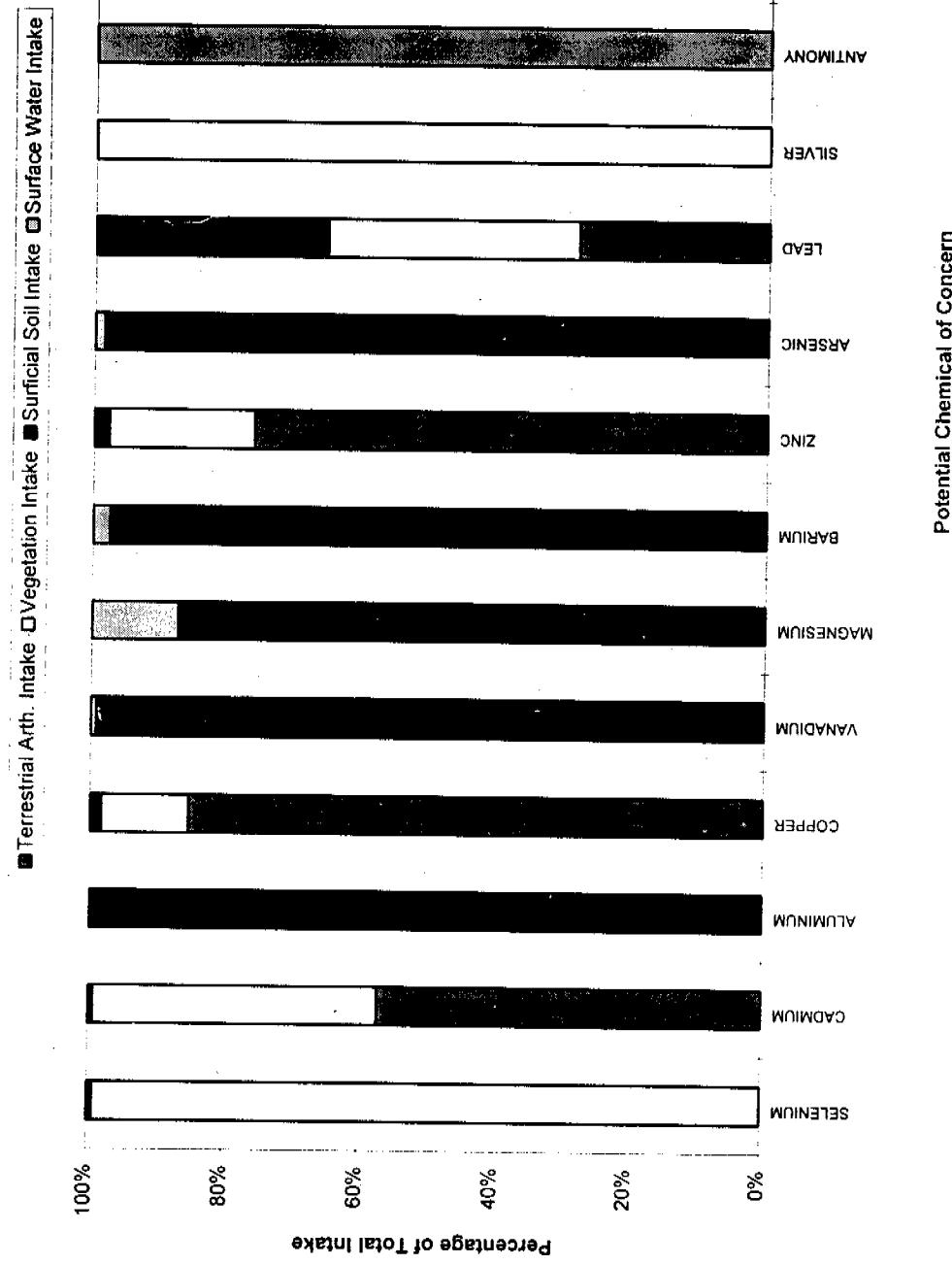


% Contributions of PCOCs to Total Risk



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 881 Hillside Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 881 Hillside Source Area at RFETS

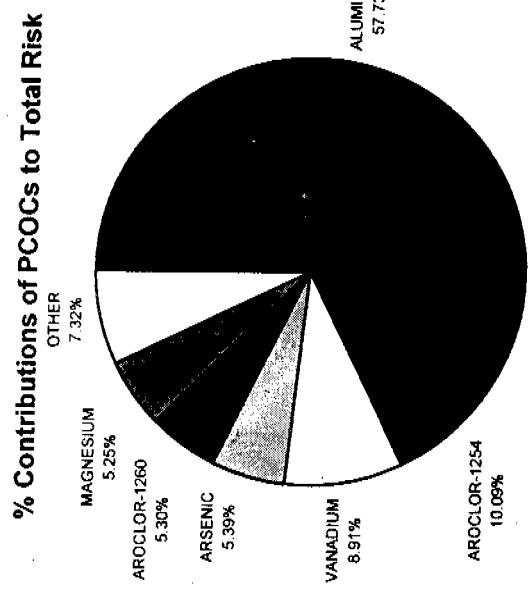
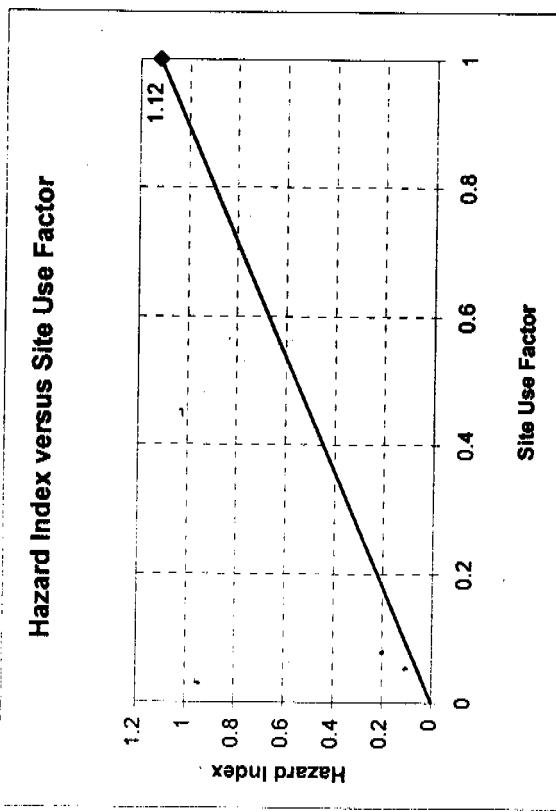
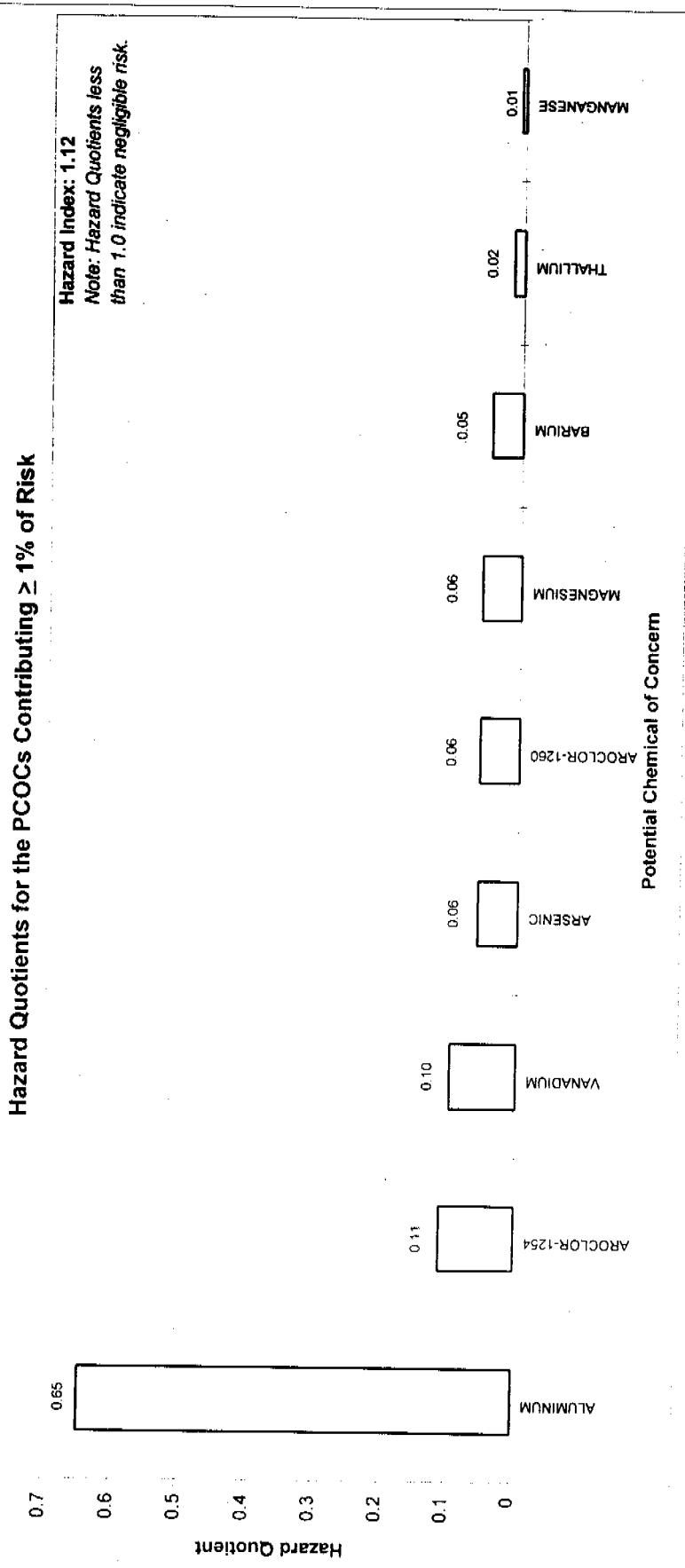
PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY				
		Terrestrial Arth.			Vegetation			Surficial Soil			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU1	IR = 0.05 SUF = 1.0	UCL ₉₅ Intake	IR = 0.119 SUF = 1.0	UCL ₉₅ Estimated Value	Intake	UCL ₉₅ Intake	UCL ₉₅ Surficial Soil	IR = 0.00408 SUF = 1.0	UCL ₉₅ Intake	IR = 0.15 SUF = 1.0	0.30	0.29	1.04	33.07%	
SELENIUM	ND	—	2.51	—	0.30	0.51	2.08E-03	1.95E-03	2.93E-04	0.30	—	0.45	0.45	0.88	28.06%	
CADMIUM	4.57	0.23	1.41	0.17	0.61	2.49E-03	1.61E-03	2.41E-04	0.40	—	—	0.14	58.52	95.89	0.61	
ALUMINUM	NR	—	NR	0.00E+00	14308.32	58.38	0.93	0.01	1.41E-03	8.86	—	43.33	—	0.20	19.36%	
COPPER	151.48	7.57	9.56	1.14	35.48	0.14	0.01	1.32E-03	0.17	2.07	0.08	—	—	0.20	6.48%	
VANADIUM	NR	—	NR	0.00E+00	41.86	0.17	0.01	1.32E-03	0.17	—	—	—	—	0.08	2.64%	
MAGNESIUM	NR	—	NR	0.00E+00	3418.57	13.95	13.58	2.04	15.99	—	244.23	0.07	—	—	2.08%	
BARIUM	NR	—	NR	0.00E+00	179.14	0.73	0.12	0.02	0.75	—	14.22	0.05	—	—	1.67%	
ZINC	242.98	12.15	28.74	3.42	85.55	0.35	0.05	0.01	15.93	—	418.66	0.04	—	—	1.21%	
ARSENIC	NR	—	NR	0.00E+00	5.38	0.02	2.04E-03	3.06E-04	0.02	0.63	0.04	—	—	0.04	1.12%	
LEAD	3.26	0.16	1.79	0.21	48.00	0.20	3.47E-03	5.20E-04	0.57	—	20.93	0.03	—	—	0.87%	
SILVER	ND	—	9.24	1.10	ND	—	3.41E-03	5.11E-04	1.10	—	58.63	0.02	—	—	0.60%	
ANTIMONY	NR	—	NR	0.00E+00	ND	—	0.02	2.30E-03	2.30E-03	0.14	—	0.02	—	0.02	0.50%	
MERCURY	ND	—	ND	—	0.05	2.20E-04	1.18E-04	1.77E-05	2.37E-04	0.02	—	0.01	—	0.01	0.45%	
NITRATE/NITRITE	NR	—	NR	0.00E+00	2.11	0.01	2.62	0.39	0.40	—	34.67	0.01	—	—	0.37%	
ACROCLOR-1254	X	—	NR	1.82E-03	2.16E-04	0.26	1.05E-03	ND	—	1.27E-03	0.14	—	0.01	0.01	0.28%	
BENZYL ALCOHOL	NR	—	NR	1.82	0.22	0.20	8.29E-04	ND	—	0.22	—	27.31	0.01	—	0.25%	
MANGANESE	NR	—	NR	0.00E+00	312.55	1.28	0.06	0.01	1.28	—	230.26	0.01	—	—	0.18%	
THALLIUM	NR	—	NR	0.00E+00	0.66	2.67E-03	1.96E-03	2.95E-04	2.97E-03	0.60	—	<0.01	<0.01	—	0.16%	
ACROCLOR-1248	X	—	NR	1.67E-04	0.12	5.03E-04	ND	—	6.70E-04	0.14	—	<0.01	<0.01	—	0.15%	
BERYLLIUM	NR	—	NR	1.40E-03	1.67E-04	0.12	5.03E-04	ND	—	—	—	<0.01	<0.01	—	0.10%	
TIN	NR	—	NR	0.00E+00	43.09	0.18	0.02	3.57E-03	0.18	—	65.96	<0.01	—	—	0.09%	
COBALT	NR	—	NR	0.00E+00	8.34	0.03	0.01	1.01E-03	0.04	—	13.19	<0.01	<0.01	—	0.08%	
LITHIUM	NR	—	NR	1.40E-03	1.67E-04	0.12	9.47	0.04	0.02	3.08E-03	0.04	—	24.57	<0.01	—	0.05%
BENZO(a)PYRENE	X	—	NR	4.10E-03	4.88E-04	0.31	1.27E-03	ND	—	1.76E-03	1.16	—	<0.01	<0.01	—	0.05%
NICKEL	NR	—	NR	0.00E+00	43.09	0.18	0.02	3.57E-03	0.18	—	1.14E-03	0.12	104.67	<0.01	—	0.04%
MOLYBDENUM	NR	—	NR	0.00E+00	8.34	0.03	0.01	3.15E-03	0.04	—	—	11.55	<0.01	—	—	0.03%
DIBENZO(a,h)ANTHRACENE	X	—	NR	1.54E-03	1.84E-04	0.19	7.71E-04	ND	—	9.55E-04	1.16	—	<0.01	<0.01	—	0.03%
STRONTIUM	NR	—	NR	1.26E-03	1.50E-04	0.30	61.65	0.25	0.41	0.06	0.31	—	688.18	<0.01	—	0.01%
BENZO(a)ANTHRACENE	X	—	NR	4.92E-03	5.86E-04	0.33	1.33E-03	ND	—	1.92E-03	11.63	—	<0.01	<0.01	—	0.01%
TOTAL XYLEMES	X	—	NR	—	NR	—	NR	—	2.51E-03	3.76E-04	2.40	—	<0.01	<0.01	—	<0.01%
BENZO(b)FLUORANTHENE	X	—	NR	1.94E-03	2.30E-04	0.31	1.28E-03	ND	—	1.51E-03	11.63	—	<0.01	<0.01	—	<0.01%
BENZO(k)FLUORANTHENE	X	—	NR	1.26E-03	1.50E-04	0.30	1.21E-03	ND	—	1.36E-03	11.63	—	<0.01	<0.01	—	<0.01%
CHROMIUM	ND	—	5.71	0.68	35.00	0.14	3.95E-03	5.93E-04	0.82	7161.75	<0.01	—	—	—	<0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	0.00E+00	ND	—	0.02	2.26E-03	2.26E-03	21.32	<0.01	<0.01	<0.01	<0.01	<0.01%	
INDENO(1,2,3-cd)PYRENE	X	—	NR	2.79E-04	3.32E-05	0.20	8.31E-04	ND	—	8.64E-04	11.63	<0.01	<0.01	<0.01	<0.01%	
PYRENE	X	—	NR	0.03	3.66E-03	0.69	2.83E-03	ND	—	0.01	87.32	<0.01	<0.01	<0.01	<0.01%	
FLUORANTHENE	X	—	NR	0.03	3.38E-03	0.76	3.11E-03	ND	—	0.01	145.53	<0.01	<0.01	<0.01	<0.01%	
ACETONE	NR	—	NR	—	NR	—	NR	—	0.01	1.05E-03	26.17	<0.01	<0.01	<0.01	<0.01%	
METHYLENE CHLORIDE	NR	—	NR	—	NR	—	NR	—	—	5.68E-04	15.31	<0.01	<0.01	<0.01	<0.01%	
FLUORENE	X	—	NR	0.03	3.41E-03	0.19	7.86E-04	ND	—	4.19E-03	145.53	<0.01	<0.01	<0.01	<0.01%	
TETRACHLOROETHENE	X	—	NR	—	NR	—	NR	—	2.82E-03	4.23E-04	16.30	<0.01	<0.01	<0.01	<0.01%	
ACENAPHTHENE	X	—	NR	0.03	3.68E-03	0.19	7.95E-04	ND	—	4.48E-03	203.75	<0.01	<0.01	<0.01	<0.01%	
CHRYSENE	X	—	NR	0.01	9.51E-04	0.36	1.47E-03	ND	—	2.42E-03	116.34	<0.01	<0.01	<0.01	<0.01%	

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the 881 Hillside Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY			
881 HILLSIDE		Terrestrial Arth.					Vegetation					Surficial Soil		Surface Water	
Analyte	PCOC for OU1	UCL ₉₅ for IR = 0.05	Intake	UCL ₉₅ for IR = 0.119	Estimated Value	Intake	UCL ₉₅ for IR = 0.00408	Intake	UCL ₉₅ for IR = 0.15	Intake	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
1,2-DICHLOROETHENE	X	NR	—	NR	NR	—	NR	—	2.50E-03	3.75E-04	19.79	<0.01	<0.01%		
CARBON DISULFIDE		PCOC for OU1	SUF = 1.0	SUF = 1.0			NR	—	2.57E-03	3.86E-04	29.02	<0.01	<0.01%		
TOLUENE	X	NR	—	NR	NR	—	NR	—	2.64E-03	3.95E-04	30.22	<0.01	<0.01%		
ALDRIN		NR	—	NR	NR	—	ND	—	4.20E-05	6.30E-06	0.52	<0.01	<0.01%		
NAPHTHALENE	X	NR	—	NR	0.09	0.01	0.19	7.94E-04	ND	—	0.01	1163.43	<0.01	<0.01%	
BENZO(ghi)PERYLENE	X	NR	—	NR	6.26E-04	7.45E-05	0.21	8.37E-04	ND	—	9.12E-04	116.34	<0.01	<0.01%	
PHENANTHRENE	X	NR	—	NR	0.05	0.01	0.56	2.28E-03	ND	—	0.01	1163.43	<0.01	<0.01%	
1,2-DICHLOROETHANE	X	NR	—	NR	NR	—	NR	—	2.66E-03	3.99E-04	61.19	<0.01	<0.01%		
1,1-DICHLOROETHANE	X	NR	—	NR	NR	—	NR	—	2.53E-03	3.80E-04	79.15	<0.01	<0.01%		
ANTHRACENE	X	NR	—	NR	0.02	2.50E-03	0.20	8.26E-04	ND	—	3.32E-03	1164.28	<0.01	<0.01%	
TRICHLOROETHENE	X	NR	—	NR	NR	—	NR	—	2.58E-03	3.88E-04	171.04	<0.01	<0.01%		
1,1-DICHLOROETHANE	X	NR	—	NR	NR	—	NR	—	2.51E-03	3.77E-04	263.85	<0.01	<0.01%		
ETHYL BENZENE		NR	—	NR	NR	—	NR	—	2.50E-03	3.76E-04	358.83	<0.01	<0.01%		
1,1,1-TRICHLOROETHANE	X	NR	—	NR	NR	—	NR	—	2.52E-03	3.77E-04	1223.29	<0.01	<0.01%		
2-BUTANONE		NR	—	NR	NR	—	NR	—	0.01	7.84E-04	4672.70	<0.01	<0.01%		

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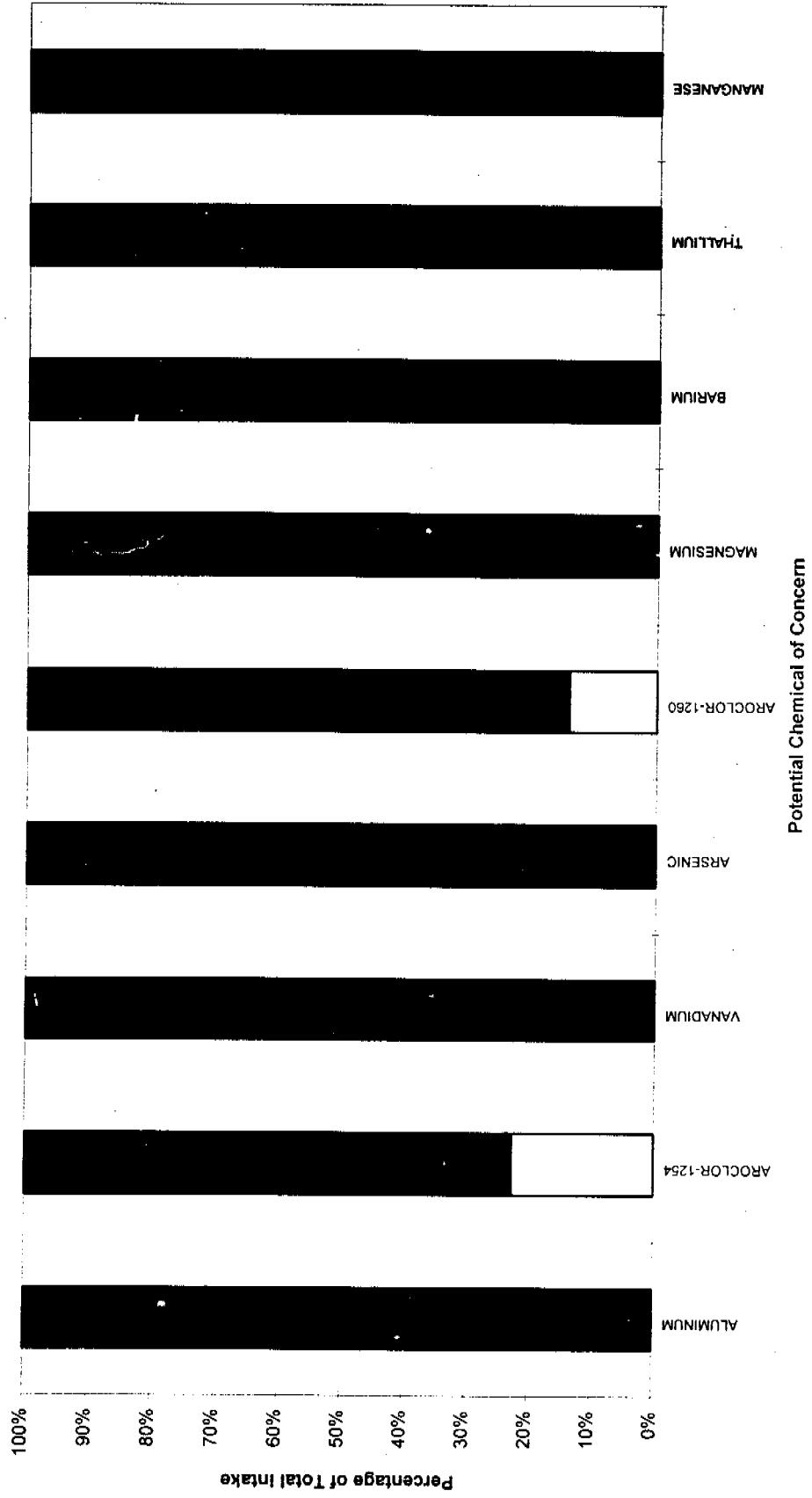
Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Mound Area Source Area at RFETS



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Mound Area at RFETS

Contribution of Exposure Points to Total Intake

Terrestrial Anth. Intake □ Vegetation Intake ■ Subficial Soil Intake □ Surface Water Intake



Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Mound Area Source Area at RFFTS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY			
MOULD AREA		Terrestrial Arth.					Vegetation					Surficial Soil		Surface Water	
Analyte ¹	PCOC for OU2	UCL ₉₅ IR = 0.05 SUF = 1.0	UCL ₉₅ IR = 0.17 SUF = 1.0	UCL ₉₅ IR = 0.00408 SUF = 1.0	UCL ₉₅ IR = 1.0 SUF = 1	UCL ₉₅ Intake	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk					
ALUMINUM	NR	—	NR	0	15228.01	62.13	NR	—	62.13	95.89	0.65	0.65	57.73%		
ACROCLOR-1254	X	NR	—	NR	0.02	3.65E-03	3.04	0.01	NR	—	0.02	0.14	0.11	10.09%	
VANADIUM		NR	—	NR	0	50.76	0.21	NR	—	0.21	2.07	0.10	0.10	8.91%	
ARSENIC		NR	—	NR	0	9.35	0.04	NR	—	0.04	0.63	0.06	0.06	5.39%	
ACROCLOR-1260	X	NR	—	NR	0.01	1.19E-03	1.78	0.01	NR	—	0.01	0.14	0.06	5.30%	
MAGNESIUM		NR	—	NR	0	3527.10	14.39	NR	—	14.39	244.23	0.06	0.06	5.25%	
BARIUM		NR	—	NR	0	160.34	0.65	NR	—	0.65	14.22	0.05	0.05	4.10%	
THALLIUM		NR	—	NR	0	2.33	0.01	NR	—	0.01	0.60	0.02	0.02	1.40%	
MANGANESE		NR	—	NR	0	338.31	1.38	NR	—	1.38	230.26	0.01	0.01	0.53%	
LEAD	X	NR	—	NR	0	19.45	0.08	NR	—	0.08	20.93	<0.01	<0.01	0.34%	
COBALT		NR	—	NR	0	10.19	0.04	NR	—	0.04	13.19	<0.01	<0.01	0.28%	
LITHIUM		NR	—	NR	0	11.19	0.05	NR	—	0.05	24.57	<0.01	<0.01	0.17%	
COPPER		NR	—	NR	0	15.23	0.06	NR	—	0.06	43.33	<0.01	<0.01	0.13%	
BENZO(a)PYRENE	X	NR	—	NR	2.25E-03	3.82E-04	0.17	6.95E-04	NR	—	1.08E-03	1.16	<0.01	0.08%	
STRONTIUM		NR	—	NR	0	129.27	0.53	NR	—	0.53	688.18	<0.01	<0.01	0.07%	
ZINC		NR	—	NR	0	66.49	0.27	NR	—	0.27	418.66	<0.01	<0.01	0.06%	
NICKEL		NR	—	NR	0	11.67	0.05	NR	—	0.05	104.67	<0.01	<0.01	0.04%	
CHROMIUM	X	62.80	3.14	NR	0	12.86	0.05	NR	—	3.19	7161.75	<0.01	<0.01	0.04%	
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	0.04	7.28E-03	0.54	2.20E-03	NR	—	0.01	21.32	<0.01	0.04%	
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	7.64E-04	1.30E-04	0.56	2.27E-03	NR	—	2.40E-03	11.63	<0.01	0.02%	
BENZO(b)FLUORANTHENE	X	NR	—	NR	2.09E-03	3.55E-04	0.34	1.38E-03	NR	—	1.73E-03	11.63	<0.01	0.01%	
BENZO(a)ANTHRACENE	X	NR	—	NR	2.70E-03	4.58E-04	0.18	7.30E-04	NR	—	1.19E-03	11.63	<0.01	0.01%	
PYRENE	X	NR	—	NR	0.01	1.55E-03	0.21	8.43E-04	NR	—	2.40E-03	87.32	<0.01	<0.01%	
BENZO(ghi)PERYLENE	X	NR	—	NR	1.70E-03	2.89E-04	0.56	2.27E-03	NR	—	2.56E-03	116.34	<0.01	<0.01%	
FLUORANTHENE	X	NR	—	NR	0.01	1.77E-03	0.28	1.14E-03	NR	—	2.91E-03	145.53	<0.01	<0.01%	
PHENANTHRENE	X	NR	—	NR	0.04	7.33E-03	0.46	1.86E-03	NR	—	0.01	1163.43	<0.01	<0.01%	
CHRYSENE	X	NR	—	NR	2.22E-03	3.77E-04	0.10	4.08E-04	NR	—	7.85E-04	116.34	<0.01	<0.01%	

¹ Chromium concentrations in terrestrial arthropods estimated from tissue:soil ratios in East Trenches source area.

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Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the C-Ponds Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE C-PONDS		EXPOSURE POINT												SUMMARY			
		Terrestrial Arth.				Vegetation				Surficial Soil				Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
		UCL ₉₅	Intake	UCL ₉₅	IR = 0.119 SUF = 1.0	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	UCL ₉₅	Intake	UCL ₉₅	IR = 0.00408 SUF = 1.0				
CADMIUM	PCOC for OUS	NC	—	2.48	0.30	ND	—	2.59E-03	3.88E-04	0.30	0.45	0.66	89.24%				
COPPER	X	NC	—	8.93	1.06	NC	—	0.01	1.20E-03	1.06	43.33	0.02	3.33%				
ANTIMONY	X	NR	—	NR	0.00	ND	—	0.02	2.31E-03	2.31E-03	0.14	0.02	2.16%				
ZINC	X	NC	—	41.40	4.93	NC	—	0.05	0.01	4.93	418.66	0.01	1.60%				
LEAD	X	NC	—	1.36	0.16	NC	—	0.01	9.47E-04	0.16	20.93	0.01	1.03%				
MAGNESIUM		NR	—	NR	0	NC	—	10.77	1.62	1.62	244.23	0.01	0.90%				
ALUMINUM		NR	—	NR	0	NC	—	2.43	0.36	0.36	95.89	<0.01	0.52%				
NITRATE/NITRITE		NR	—	NR	0	NR	—	0.54	0.08	0.08	34.67	<0.01	0.32%				
MERCURY	X	ND	—	ND	—	ND	—	1.41E-04	2.12E-05	2.12E-05	0.02	<0.01	0.17%				
BARIUM	X	NR	—	NR	0	NC	—	0.11	0.02	0.02	14.22	<0.01	0.16%				
SELENIUM		ND	—	ND	—	NC	—	1.85E-03	2.78E-04	2.78E-04	0.29	<0.01	0.13%				
VANADIUM		NR	—	NR	0	NC	—	0.01	1.74E-03	1.74E-03	2.07	<0.01	0.11%				
THALLIUM		NR	—	NR	0	ND	—	2.34E-03	3.50E-04	3.50E-04	0.60	<0.01	0.08%				
ARSENIC		NR	—	NR	0	NC	—	2.23E-03	3.34E-04	3.34E-04	0.63	<0.01	0.07%				
MOLYBDENUM		NR	—	NR	0	ND	—	0.02	3.52E-03	3.52E-03	11.55	<0.01	0.04%				
CHROMIUM		ND	—	10.96	1	NC	—	4.76E-03	7.15E-04	1.30	7161.75	<0.01	0.02%				
LITHIUM	X	NR	—	NR	0	NC	—	0.02	3.11E-03	3.11E-03	24.57	<0.01	0.01%				
COBALT	X	NR	—	NR	0	NC	—	0.01	1.19E-03	1.19E-03	13.19	<0.01	0.01%				
BERYLLIUM		NR	—	NR	0	ND	—	9.99E-04	1.50E-04	1.50E-04	1.73	<0.01	0.01%				
ACETONE		NR	—	NR	—	NR	—	0.01	2.17E-03	2.17E-03	26.17	<0.01	0.01%				
MANGANESE		NR	—	NR	0	NC	—	0.12	0.02	0.02	230.26	<0.01	0.02%				
STRONTIUM	X	NR	—	NR	0	NC	—	0.34	0.05	0.05	688.18	<0.01	0.01%				
TIN		NR	—	NR	0	NC	—	0.02	3.22E-03	3.22E-03	65.96	<0.01	0.01%				
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	0	ND	—	0.01	8.08E-04	8.08E-04	21.32	<0.01	0.01%				
METHYLENE CHLORIDE	X	NR	—	NR	—	NR	—	3.67E-03	5.50E-04	5.50E-04	15.31	<0.01	0.00%				
CARBON DISULFIDE		NR	—	NR	—	NR	—	2.52E-03	3.78E-04	3.78E-04	29.02	<0.01	0.00%				
TOLUENE	X	NR	—	NR	—	NR	—	2.52E-03	3.78E-04	3.78E-04	30.22	<0.01	0.00%				
NICKEL		NR	—	NR	0	NC	—	0.01	1.30E-03	1.30E-03	104.67	<0.01	0.00%				
CHLOROFORM		NR	—	NR	—	NR	—	2.57E-03	3.86E-04	3.86E-04	39.25	<0.01	0.00%				
SILVER	X	ND	—	ND	—	ND	—	3.60E-03	5.40E-04	5.40E-04	58.63	<0.01	0.00%				
2-BUTANONE		NR	—	NR	—	NR	—	0.01	8.70E-04	8.70E-04	4672.70	<0.01	0.00%				

HAZARD INDEX 0.74

Summary of Ecotoxicological Risk to Preble's Meadow Jumping Mice in the Soil Dump Areas Source Area at RFETS

PREBLE'S MEADOW JUMPING MOUSE		EXPOSURE POINT										SUMMARY				
SOIL DUMP AREAS		Terrestrial Arth.		Vegetation				Surficial Soil		Surface Water		Total		Toxicity	Hazard	Percent of Total Risk
Analyte	PCOC for OUs	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I SUF = I	Total Intake	Reference Value	Quotient		
SELENIUM	X	NR	—	6.62	—	1.13	ND	—	NR	—	1.13	0.29	3.90	3.90	34.69%	
VANADIUM	X	NR	—	26.61	—	4.52	25.69	0.10	NR	—	4.63	2.07	2.24	2.24	19.90%	
MAGNESIUM	X	NR	—	1537.93	—	261.45	2356.56	9.61	NR	—	271.06	244.23	1.11	1.11	9.88%	
MERCURY	X	NR	—	0.10	—	0.02	0.08	3.17E-04	NR	—	0.02	0.02	1.04	1.04	9.23%	
CADMIUM	X	NR	—	2.47	—	0.42	3.05	0.01	NR	—	0.43	0.45	0.96	0.96	8.54%	
ALUMINUM	X	NR	—	142.00	—	24.14	8368.17	34.14	NR	—	58.28	95.89	0.61	0.61	5.41%	
MOLYBDENUM	X	NR	—	38.99	—	6.63	ND	—	NR	—	6.63	11.55	0.57	0.57	5.11%	
BARIUM	X	NR	—	21.08	—	3.58	135.77	0.55	NR	—	4.14	14.22	0.29	0.29	2.59%	
LITHIUM	X	NR	—	32.04	—	5.45	7.90	0.03	NR	—	5.48	24.57	0.22	0.22	1.98%	
TIN	X	NR	—	38.48	—	6.54	ND	—	NR	—	6.54	65.96	0.10	0.10	0.88%	
MANGANESE	X	NR	—	48.49	—	8.24	256.10	1.04	NR	—	9.29	230.26	0.04	0.04	0.36%	
NICKEL	X	NR	—	20.48	—	3.48	10.77	0.04	NR	—	3.53	104.67	0.03	0.03	0.30%	
COPPER	X	NR	—	8.06	—	1.37	17.78	0.07	NR	—	1.44	43.33	0.03	0.03	0.30%	
ARSENIC	X	NR	—	ND	—	4.82	0.02	NR	—	0.02	0.63	0.03	0.03	0.28%		
STRONTIUM	X	NR	—	80.64	—	13.71	38.68	0.16	NR	—	13.87	688.18	0.02	0.02	0.18%	
LEAD	X	NR	—	1.22	—	0.21	25.35	0.10	NR	—	0.31	20.93	0.01	0.01	0.13%	
ZINC	X	NR	—	32.11	—	5.46	57.21	0.23	NR	—	5.69	418.66	0.01	0.01	0.12%	
THALLIUM	X	NR	—	ND	—	0.89	3.64E-03	NR	—	3.64E-03	0.60	0.01	0.01	0.05%		
AROCLOR-1254	X	NR	—	7.36E-04	—	1.25E-04	0.10	4.26E-04	NR	—	5.51E-04	0.14	<0.01	<0.01	0.03%	
COBALT	X	NR	—	ND	—	6.83	0.03	NR	—	0.03	13.19	<0.01	0.01	0.02%		
BERYLLIUM	X	NR	—	ND	—	0.70	2.87E-03	NR	—	2.87E-03	1.73	<0.01	<0.01	0.01%		
CHROMIUM	X	NR	—	ND	—	12.07	0.05	NR	—	0.05	7161.75	<0.01	<0.01	<0.01		

HAZARD INDEX 11.24

LB

SUMMARY OF ECOLOGICAL RISK TO KESTRELS

ERA source areas evaluated: All

Exposure Points:
Small mammals
Terrestrial arthropods
Sediment
Surface soil

Highest risk source area: Soil Dump Area (HI = 33.1)

PCOCs with HQ > 10: Be, Cr, Cu

Key uncertainties in exposure and risk estimate:

- Except for pesticides and PCBs, concentrations of organic contaminants in biological tissue not available. However, most are metabolized and probably do not accumulate in terrestrial biota.
- Beryllium detected in only 2 of six mice in Soil Dump Area. The maximum detected concentration was much lower than UCL₉₅ used in exposure estimate.
- Copper was not a PCOC for soils in OU 2 indicating that concentrations in vegetation may be due to natural bioaccumulation. In addition, the high HQ may be due to overestimate of bioavailability or a conservative TRV.
- Data on PCOCs in terrestrial arthropods not available for all areas. In these areas, the kestrel diet was assumed to be all small mammals.

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SUMMARY OF ECOLOGICAL RISK TO
KESTRELS
(continued)

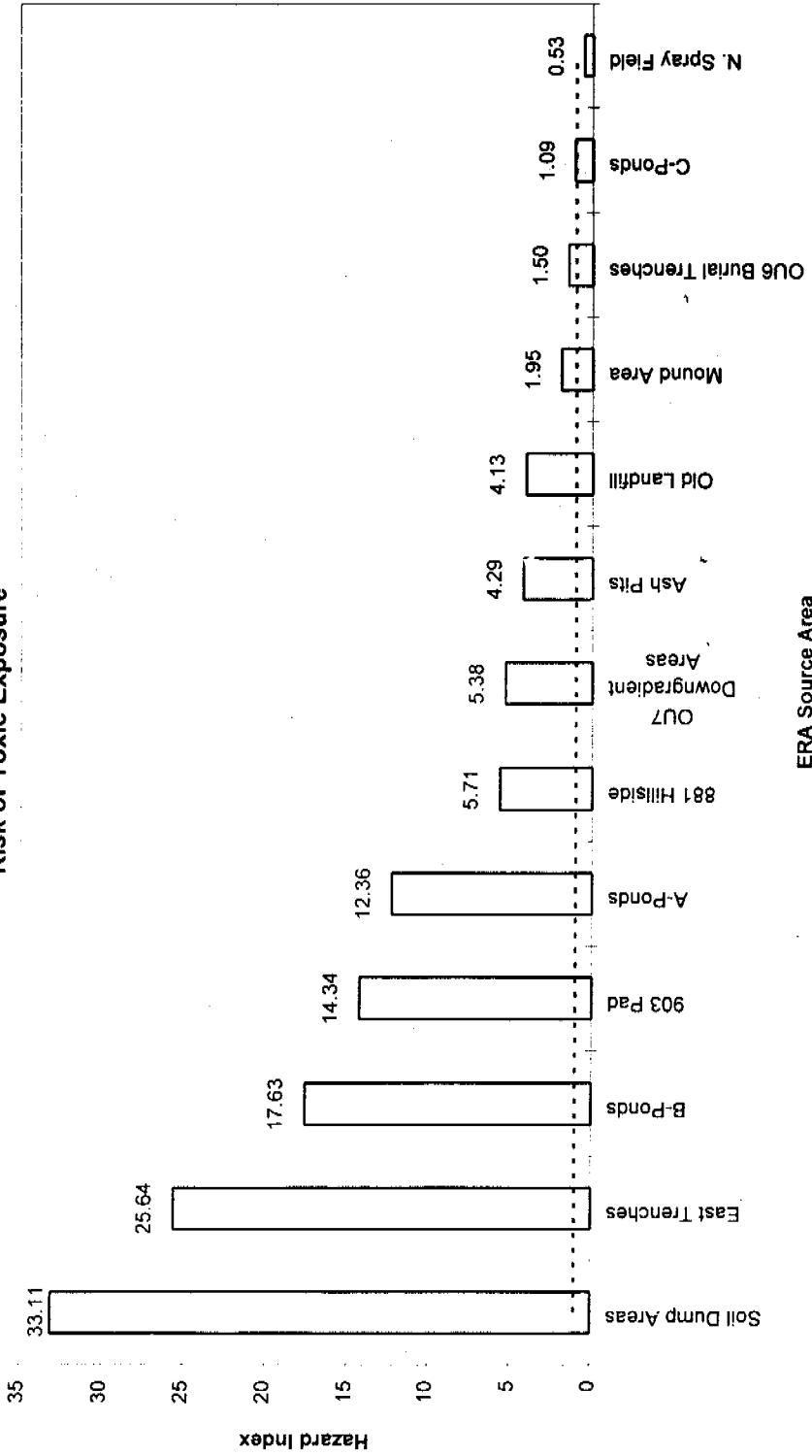
Suggested further action:

ECOCs: Beryllium in prey around soil dump area
Chromium in OU 2 areas

1. Evaluate potential sources and factors affecting bioaccumulation of beryllium and chromium in small mammals
3. Evaluate source(s) of copper intake in OU 2
2. Conduct more intensive exposure analysis including:
 - distribution of metals in prey in wider areas (i.e., drainages)
 - seasonal exposure patterns
 - potential effects on local populations

Summary of Ecotoxicological Risk to American Kestrels at RFETS

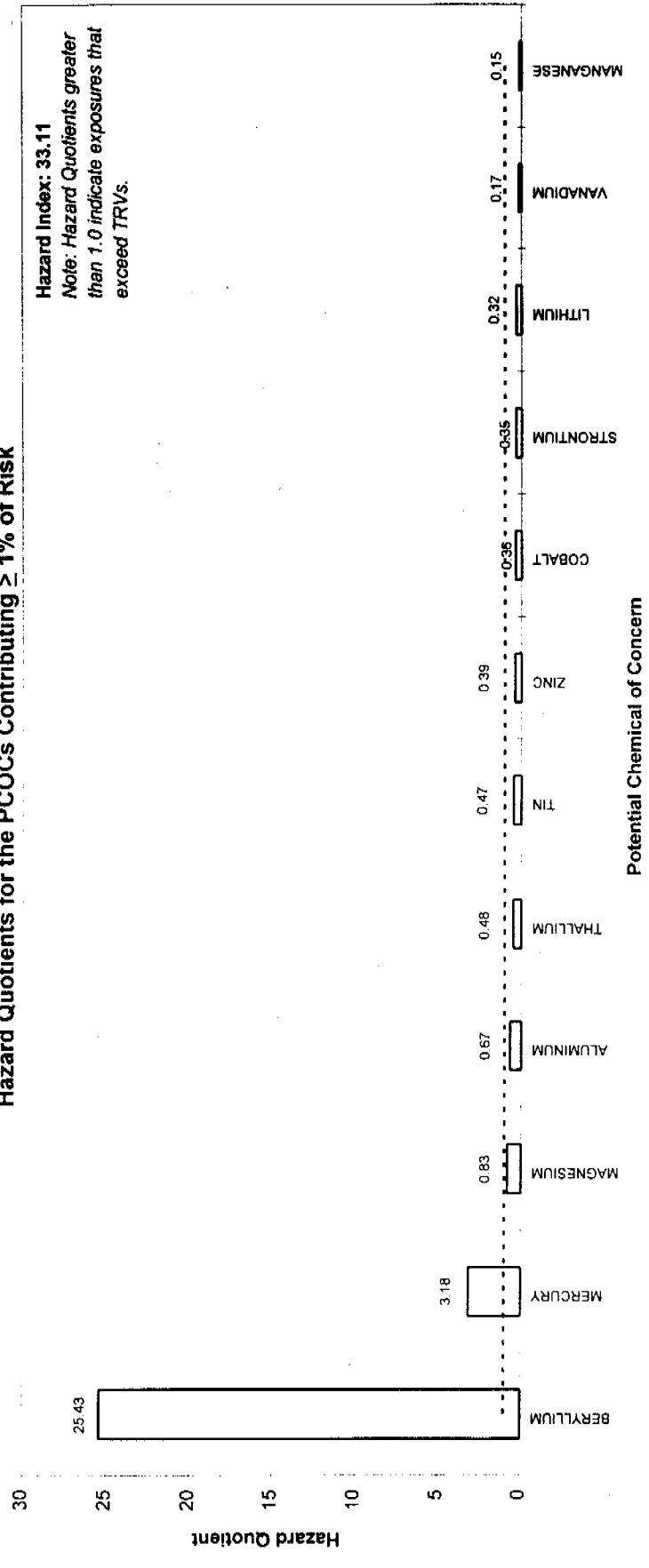
Contribution of ERA Source Areas to American Kestrels Risk of Toxic Exposure



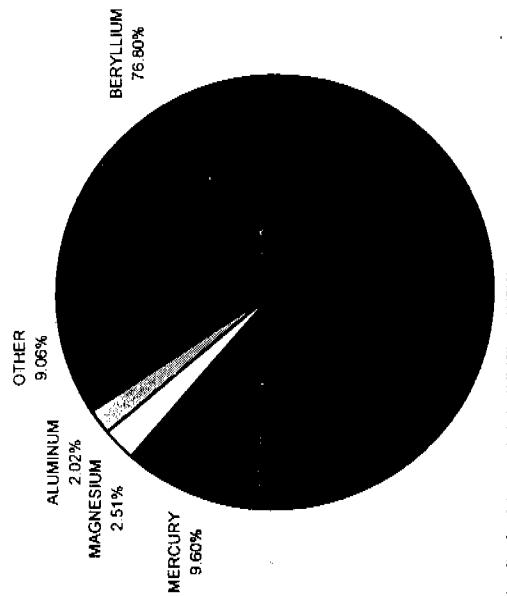
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Summary of Ecotoxicological Risk to American Kestrels in the Soil Dump Areas Source Area at RFETS

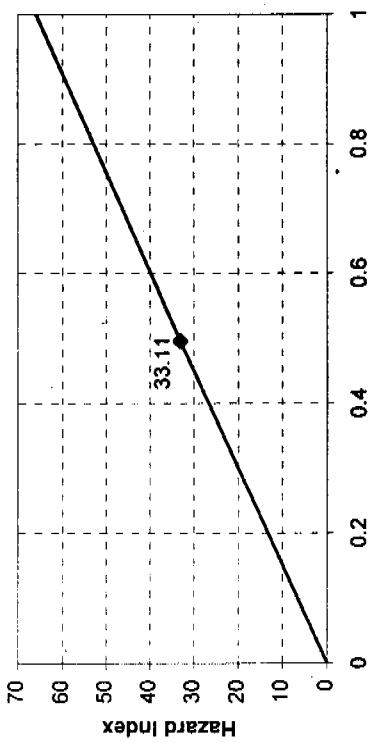
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

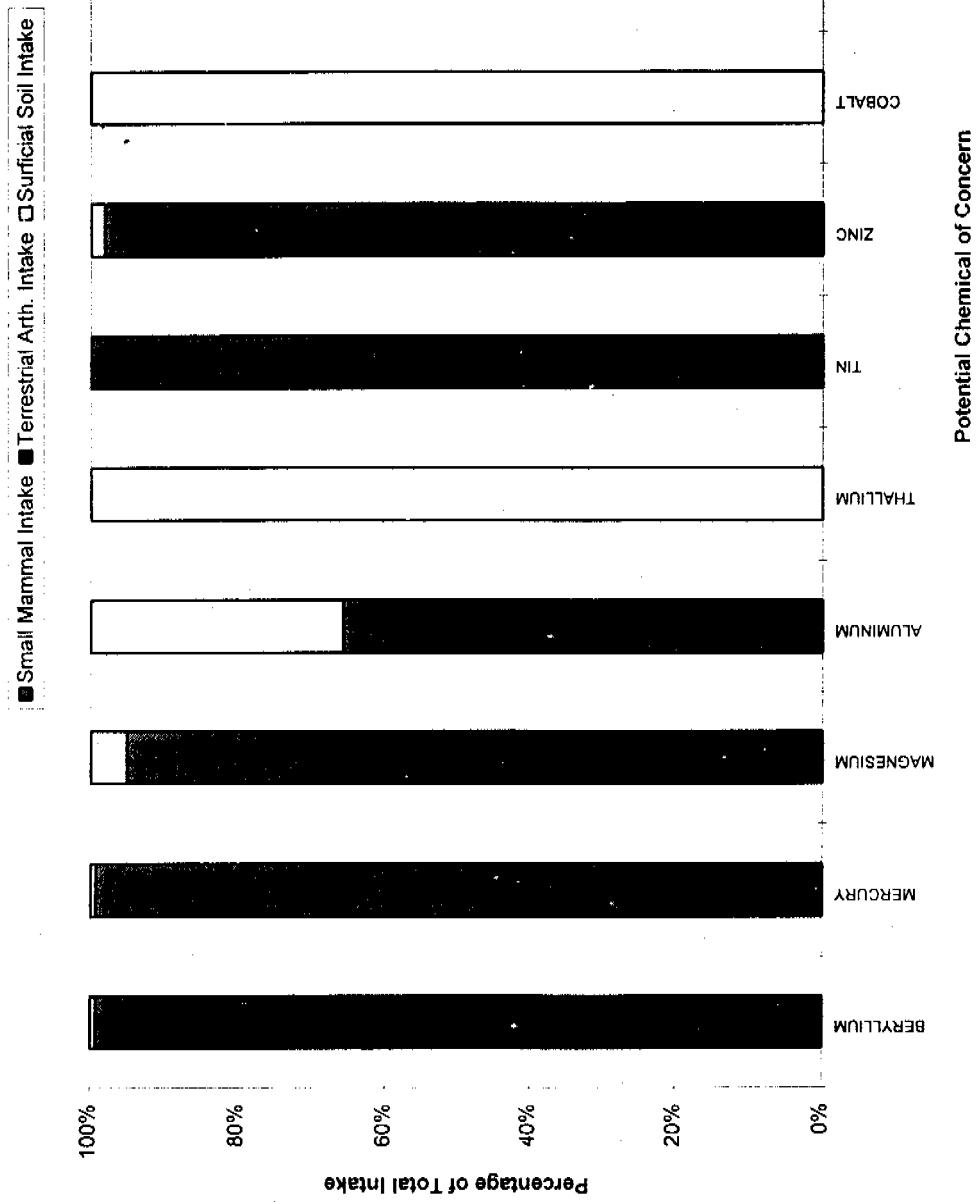


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the Soil Dump Areas Source Area at RFETS

Contribution of Exposure Points to Total Intake



(O)

Summary of Ecotoxicological Risk to American Kestrels in the Soil Dump Areas Source Area at RFETS

AMERICAN KESTREL SOIL DUMP AREAS		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
		UCL ₉₅ SUF = 0.496	Intake	UCL ₉₅	Intake	UCL ₉₅ IR = 0.00812 SUF = 0.496	Intake	0.70	2.84E-03	0.39	0.02
BERYLLIUM	X	2.70	0.39	NR	—	—	0.08	3.13E-04	0.04	0.01	3.18
MERCURY	X	0.30	0.04	NR	—	—	2356.56	9.49	195.33	234.76	0.83
MAGNESIUM	X	1292.00	185.84	NR	—	—	8368.17	33.70	98.68	147.66	0.67
ALUMINUM	X	451.74	64.98	NR	—	—	—	—	3.60E-03	0.01	0.48
THALLIUM	ND	—	—	NR	—	—	—	—	—	—	1.45%
TIN	X	77.10	11.09	NR	—	—	ND	—	11.09	—	23.39
ZINC	X	85.71	12.33	NR	—	—	57.21	0.23	12.56	—	32.10
COBALT	X	ND	—	NR	—	—	6.83	0.03	0.03	0.08	0.36
STRONTIUM	X	33.63	4.84	NR	—	—	38.68	0.16	4.99	14.15	0.35
LITHIUM	ND	—	—	NR	—	—	7.90	0.03	0.03	0.10	0.32
VANADIUM	X	ND	—	NR	—	—	25.69	0.10	0.10	0.62	0.17
MANGANESE	X	15.08	2.17	NR	—	—	256.10	1.03	3.20	21.09	0.15
LEAD	X	2.51	0.36	NR	—	—	25.35	0.10	0.46	3.85	0.12
BARIUM	X	11.86	1.71	NR	—	—	135.77	0.55	2.25	21.16	0.11
COPPER	X	9.48	1.36	NR	—	—	17.78	0.07	1.43	33.68	0.04
CHROMIUM	X	ND	—	NR	—	—	12.07	0.05	0.05	2.21	0.02
ARSENIC	X	ND	—	NR	—	—	4.82	0.02	0.02	1.85	0.01
CADMIUM	ND	—	—	NR	—	—	3.05	0.01	0.01	3.12	<0.01
AROCLOTR-1254	X	NR	—	NR	—	—	0.10	4.20E-04	0.00	0.36	<0.01
NICKEL	X	ND	—	NR	—	—	10.77	0.04	0.04	146.12	<0.01

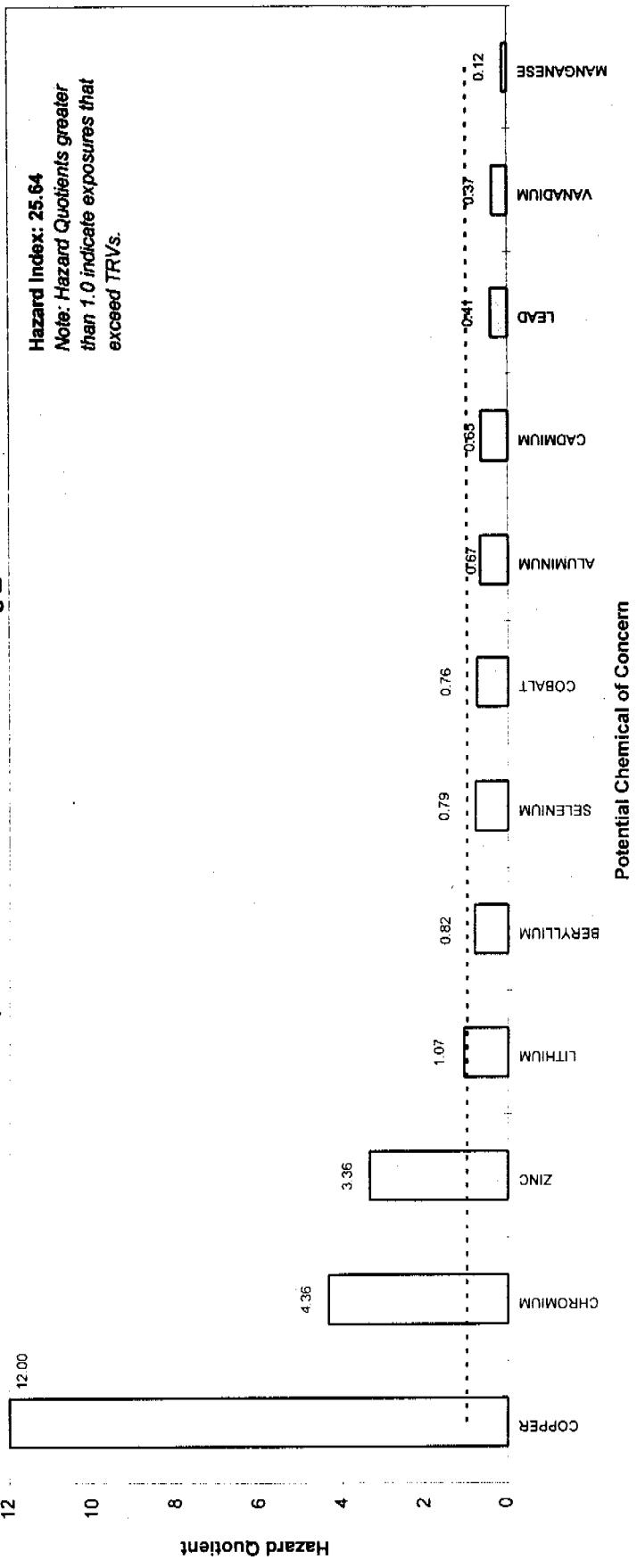
¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

HAZARD INDEX

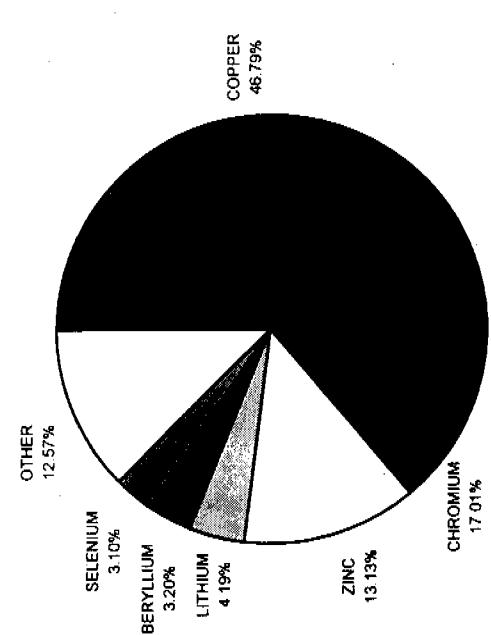
33.11

Summary of Ecotoxicological Risk to American Kestrels in the East Trenches Source Area at RFETS

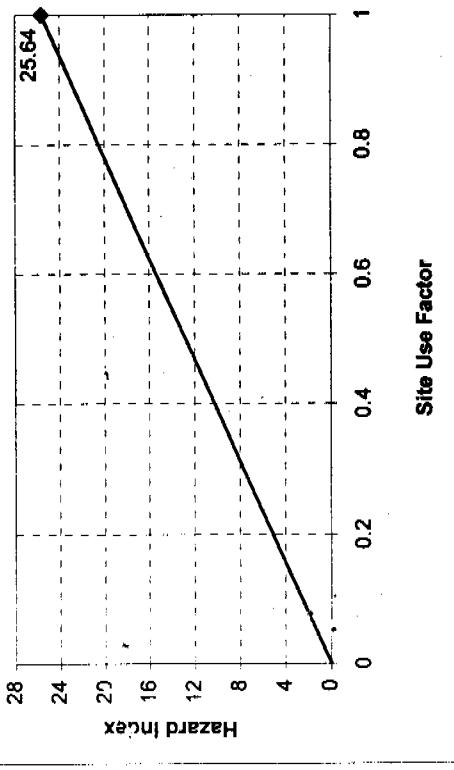
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

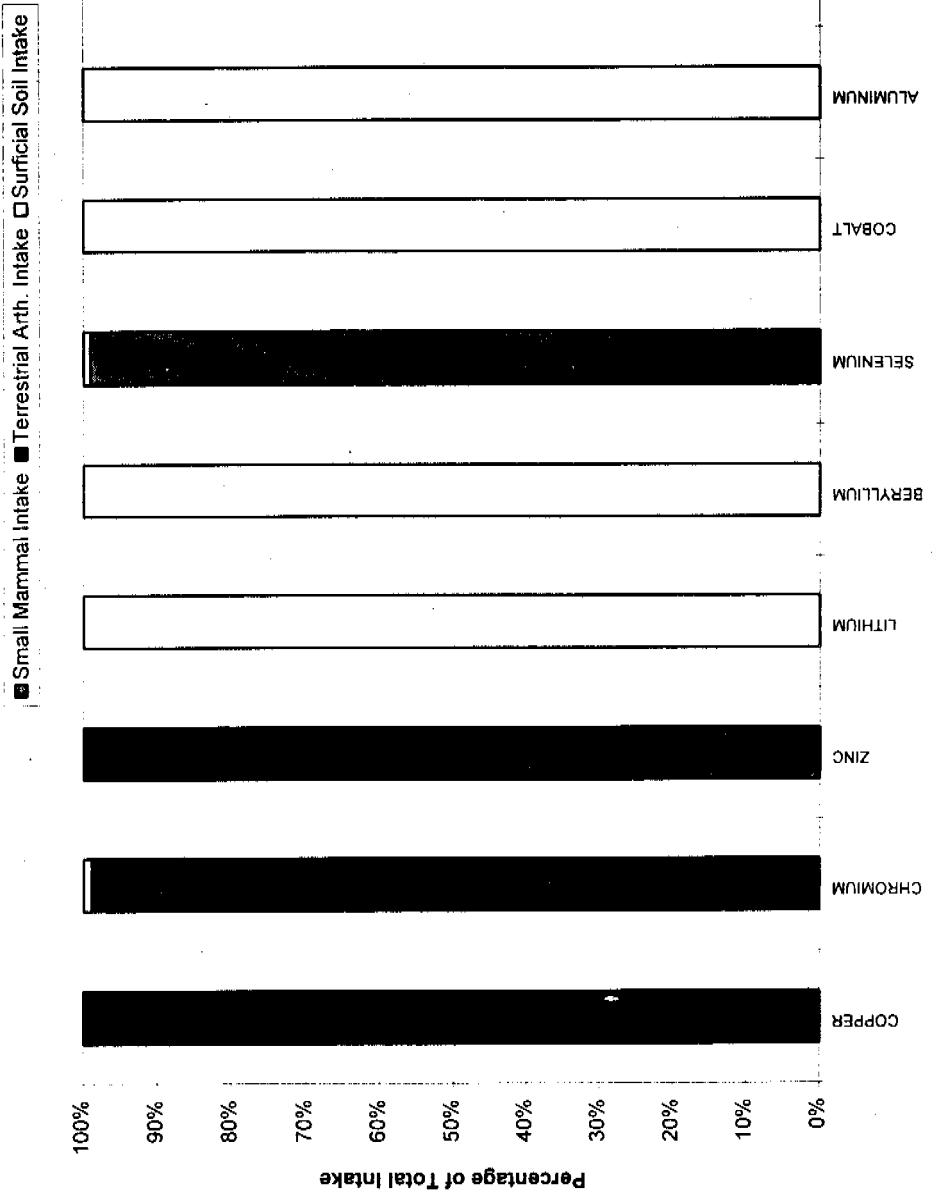


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the East Trenches Source Area at RFETS

Contribution of Exposure Points to Total Intake



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Summary of Ecotoxicological Risk to American Kestrels in the East Trenches Source Area at RFETS

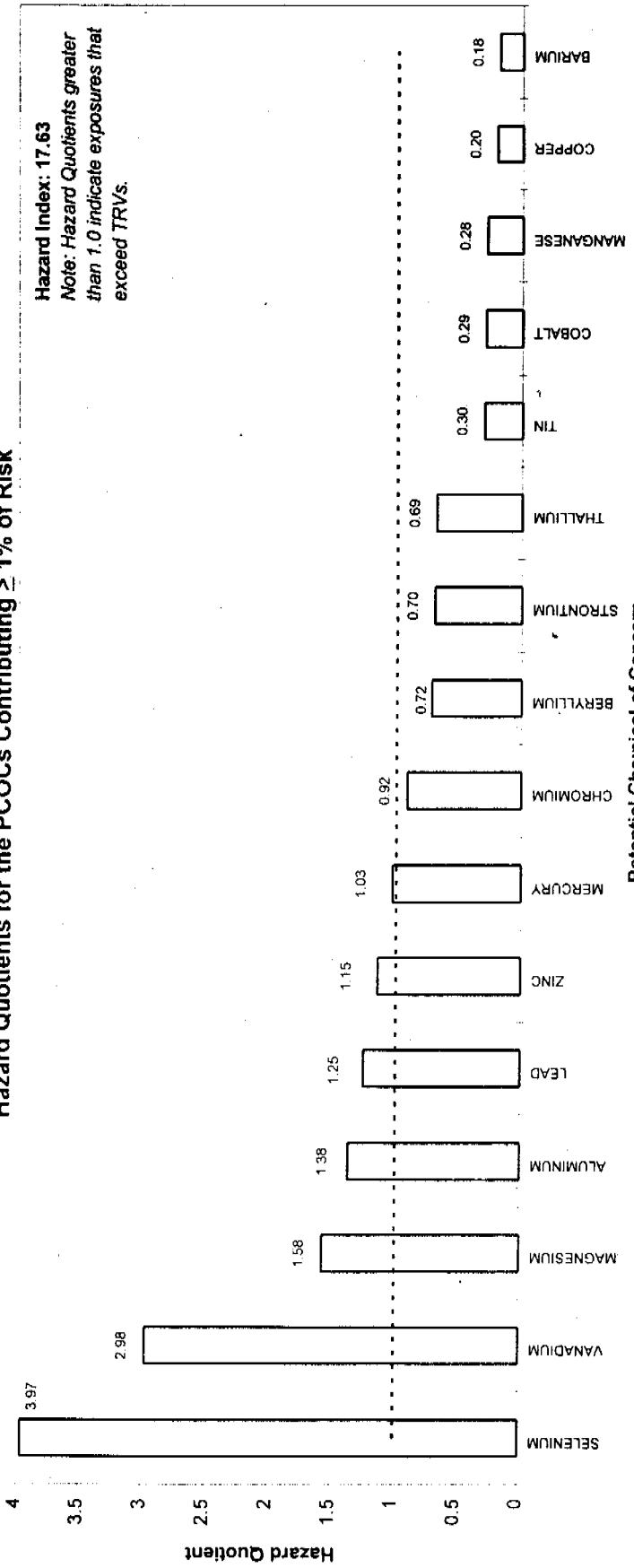
AMERICAN KESTREL EAST TRENCHES		EXPOSURE POINT						SUMMARY					
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake		Toxicity Reference Value		Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU2	UCI ₉₅ IR = 0.14 SUF = 1.0	UCI ₉₅ IR = 0.15 SUF = 1.0	UCI ₉₅ Intake	UCI ₉₅ Intake	UCI ₉₅ Intake	IR = 0.00812 SUF = 1.0	UCI ₉₅ Intake	UCI ₉₅ Intake	Reference Value	Quotient	Total Risk	
COPPER	X	ND	—	2.40	2676.87	401.53	13.08	0.11	404.04	33.68	12.00	46.79%	
CHROMIUM		308.38	43.17	63.48	9.52	12.98	0.11	9.63	2.21	4.36	17.01%		
ZINC				429.34	64.40	54.00	0.44	108.01	32.10	3.36	13.13%		
LITHIUM				NR	—	13.27	0.11	0.11	0.10	1.07	4.19%		
BERYLLIUM				NR	—	1.56	0.01	0.01	0.02	0.82	3.20%		
SELENIUM		4.61	0.65	ND	—	0.73	0.01	0.65	0.82	0.79	3.10%		
COBALT		NR	—	NR	—	7.14	0.06	0.06	0.08	0.76	2.95%		
ALUMINUM		NR	—	NR	—	122.691	99.20	99.20	147.66	0.67	2.62%		
CADMIUM		2.55	0.36	11.13	1.67	1.44	0.01	2.04	3.12	0.65	2.55%		
LEAD	X	8.39	1.20	ND	—	45.99	0.37	1.58	3.85	0.41	1.60%		
VANADIUM		NR	—	NR	—	27.79	0.23	0.23	0.62	0.37	1.43%		
MANGANESE		NR	—	NR	—	310.49	2.52	2.52	21.09	0.12	0.47%		
MAGNESIUM		NR	—	NR	—	2431.74	19.75	19.75	234.76	0.98	0.33%		
BARIUM		NR	—	NR	—	128.84	1.05	1.05	21.16	0.05	0.19%		
ARSENIC		NR	—	NR	—	5.50	0.04	0.04	1.85	0.02	0.09%		
BENZO(a)PYRENE	X	NR	—	NR	—	0.21	1.70E-03	1.70E-03	0.08	0.02	0.09%		
PHENANTHRENE	X	NR	—	NR	—	0.21	1.69E-03	1.69E-03	0.08	0.02	0.09%		
STRONTIUM		NR	—	NR	—	34.85	0.28	0.28	14.15	0.02	0.08%		
TIN		NR	—	NR	—	34.19	0.28	0.28	23.39	0.01	0.05%		
FLUORANTHENE	X	NR	—	NR	—	0.23	1.86E-03	1.86E-03	0.78	<0.01	0.01%		
PYRENE	X	NR	—	NR	—	0.22	1.77E-03	1.77E-03	0.78	<0.01	0.01%		
BENZO(a)ANTHRACENE	X	NR	—	NR	—	0.21	1.72E-03	1.72E-03	0.78	<0.01	0.01%		
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	0.20	1.61E-03	1.61E-03	0.77	<0.01	0.01%		
CHRYSENE	X	NR	—	NR	—	0.19	1.55E-03	1.55E-03	0.78	<0.01	0.01%		
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	—	0.22	1.79E-03	1.79E-03	1.20	<0.01	0.01%		
NICKEL		NR	—	NR	—	11.63	0.09	0.09	146.12	<0.01	<0.01		
SILVER		ND	—	ND	—	3.59	0.03	0.03	2304.90	<0.01	<0.01		

HAZARD INDEX 25.64

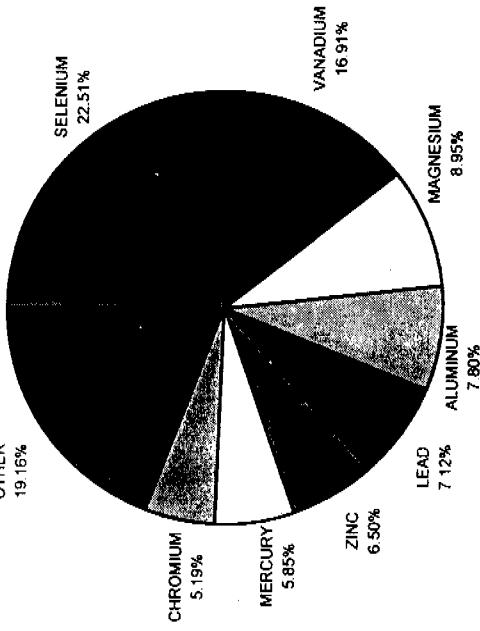
Summary of Ecotoxicological Risk to American Kestrels in the B-Ponds Source Area at RFETS

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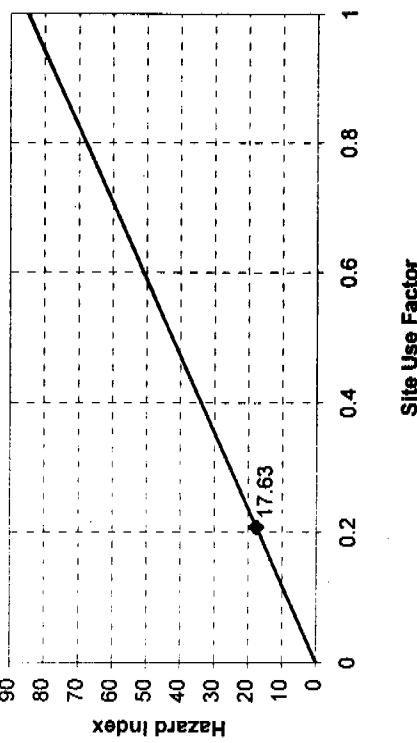
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

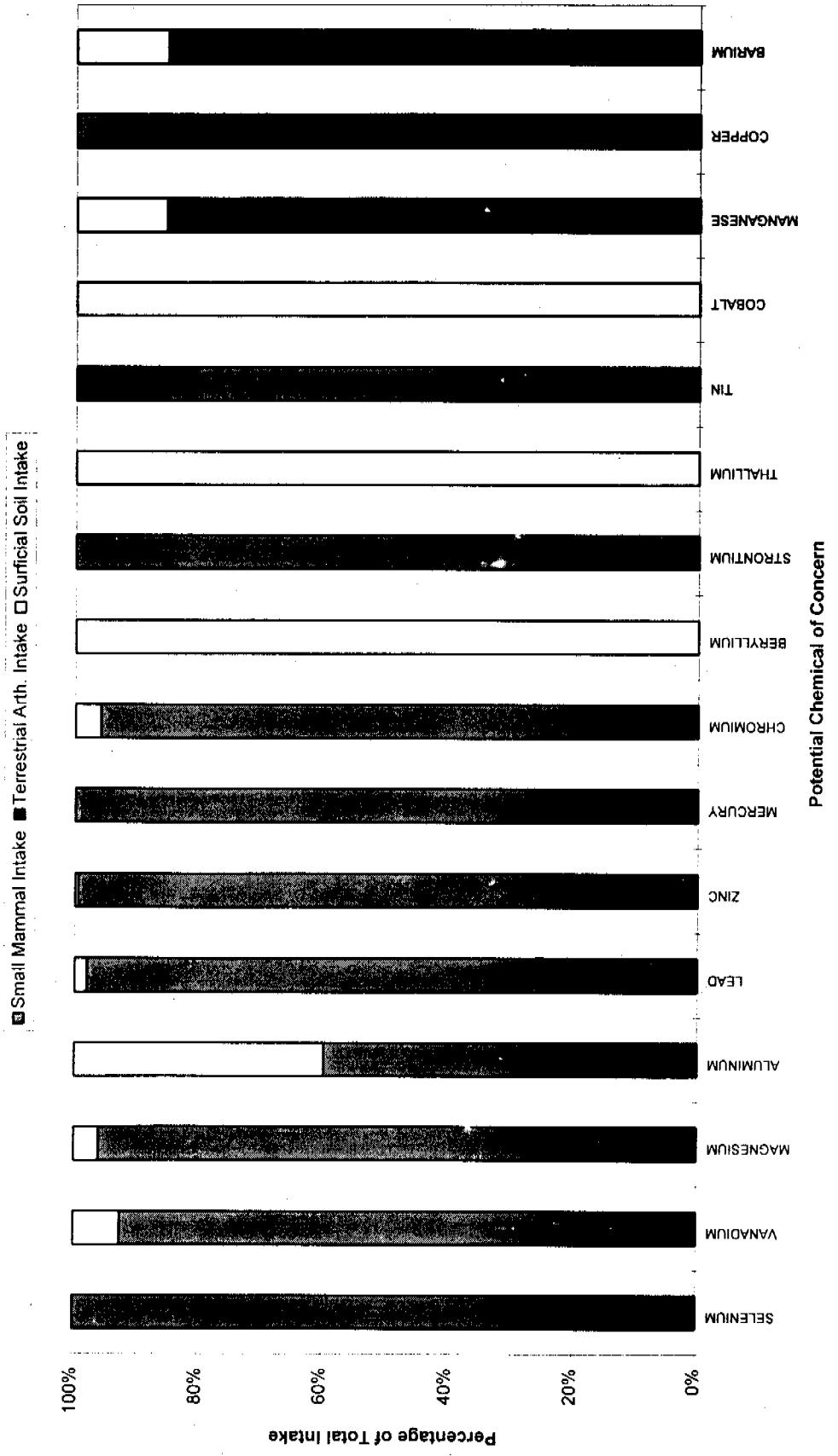


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the B-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to American Kestrels in the B-Ponds Source Area at RFETS

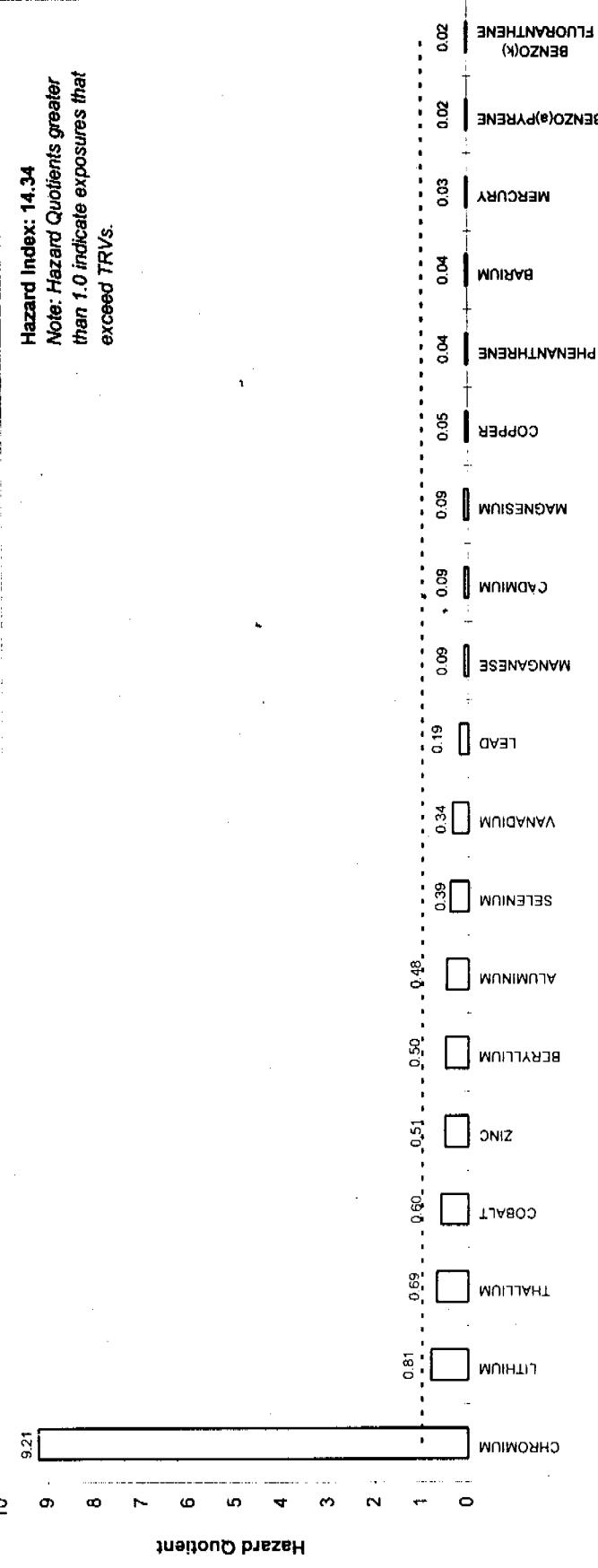
AMERICAN KESTREL B-PONDS		EXPOSURE POINT						SUMMARY						
Analyte	PCOC for OU6	Small Mammal			Terrestrial Arth.			Surficial Soil			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
		UCI ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I SUF = 1	IR = 0.00812 SUF = 0.208					
SELENIUM		53.92	3.25	NR	—	NR	—	ND	—	3.25	0.82	3.97	22.51%	
VANADIUM	X	28.18	1.70	NR	—	80.61	0.14	1.84	0.62	2.98	16.91%			
MAGNESIUM	X	5898.79	355.82	NR	—	8678.88	14.66	370.47	234.76	1.58	8.95%			
ALUMINUM		2019.91	121.84	NR	—	48139.56	81.31	203.15	147.66	1.38	7.80%			
LEAD	X	78.53	4.74	NR	—	55.00	0.09	4.83	3.85	1.25	7.12%			
ZINC	X	606.87	36.61	NR	—	112.99	0.19	36.80	32.10	1.15	6.50%			
MERCURY	X	0.23	0.01	NR	—	ND	—	0.01	0.01	1.03	5.85%			
CHROMIUM	X	32.11	1.94	NR	—	48.86	0.08	2.02	2.21	0.92	5.19%			
BERYLLIUM		ND	—	NR	—	6.57	0.01	0.01	0.02	0.72	4.08%			
STRONTIUM	X	163.89	9.89	NR	—	NC	—	9.89	14.15	0.70	3.96%			
THALLIUM	ND	—	NR	—	ND	—	3.05	0.01	0.01	0.69	3.89%			
TIN		117.72	7.10	NR	—	ND	—	7.10	23.39	0.30	1.72%			
COBALT	X	ND	—	NR	—	13.25	0.02	0.02	0.08	0.29	1.66%			
MANGANESE	X	84.59	5.10	NR	—	509.65	0.86	5.96	21.09	0.28	1.60%			
COPPER	X	112.56	6.79	NR	—	21.78	0.04	6.83	33.68	0.20	1.15%			
BARIUM	X	55.13	3.33	NR	—	337.48	0.57	3.90	21.16	0.18	1.04%			
ARSENIC	X	ND	—	NR	—	8.55	0.01	0.01	1.85	0.01	0.04%			
SILVER	X	16.47	0.99	NR	—	ND	—	0.99	2304.90	<0.01	<0.01%			
NICKEL	X	ND	—	NR	—	18.05	0.03	0.03	146.12	<0.01	<0.01%			

HAZARD INDEX 17.63

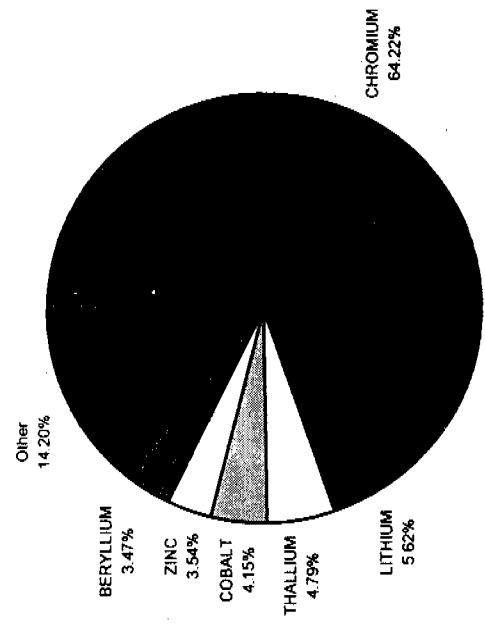
¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

Summary of Ecotoxicological Risk to American Kestrels in the 903 Pad Source Area at RFETS

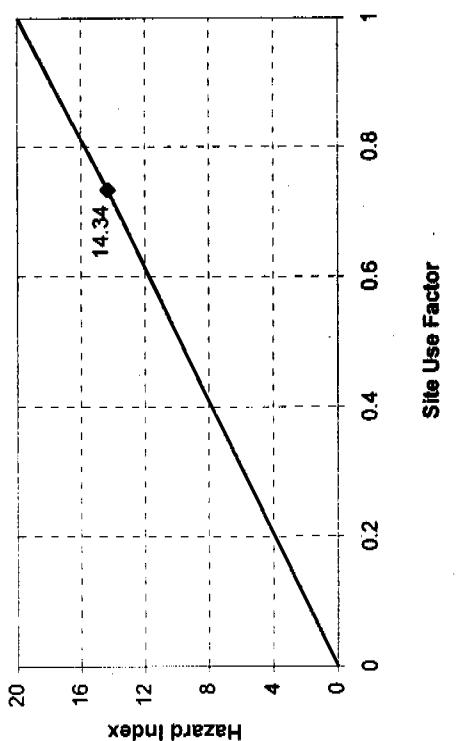
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

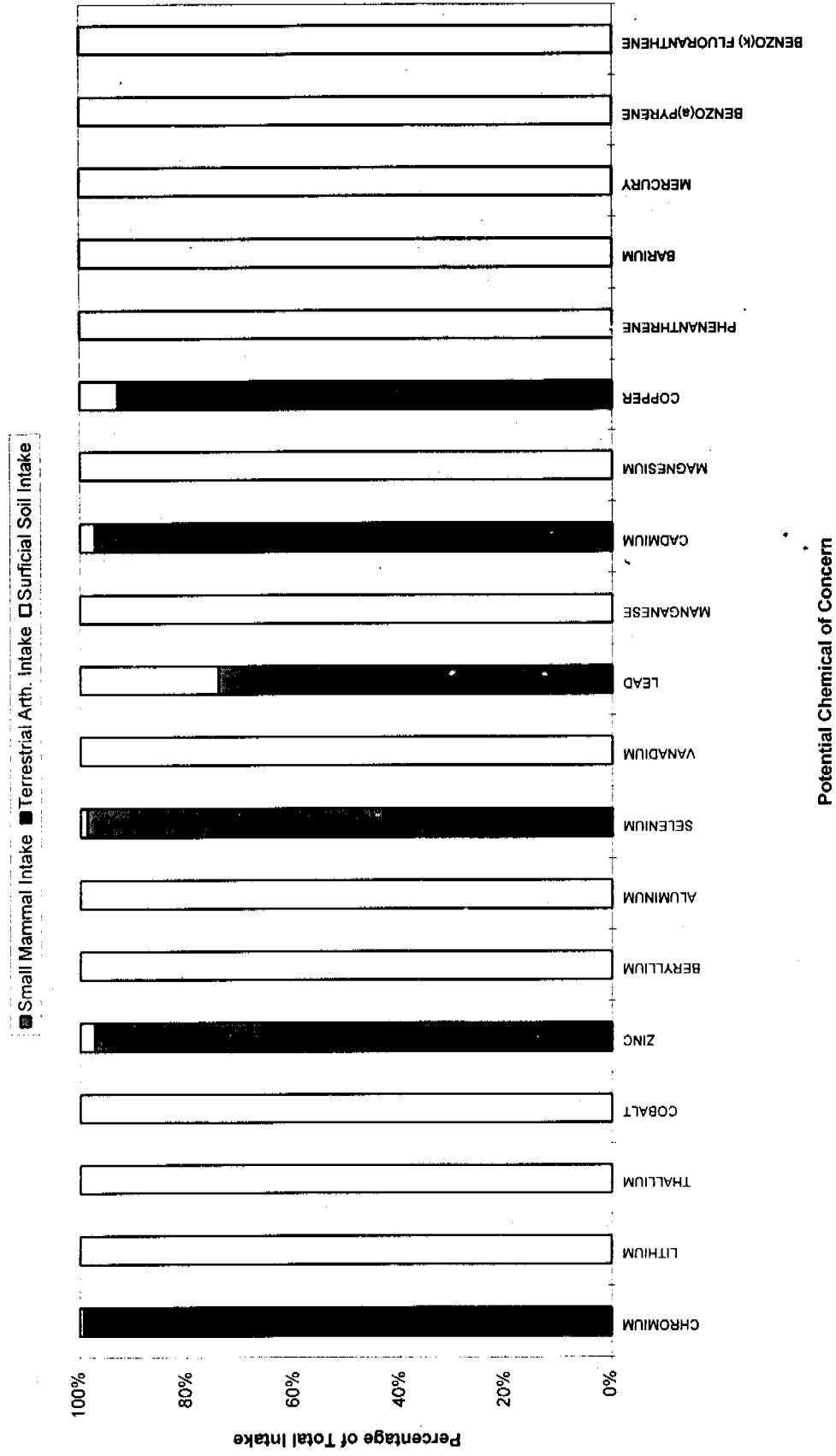


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the 903 Pad Source Area at RFETS

Contribution of Exposure Points to Total Intake



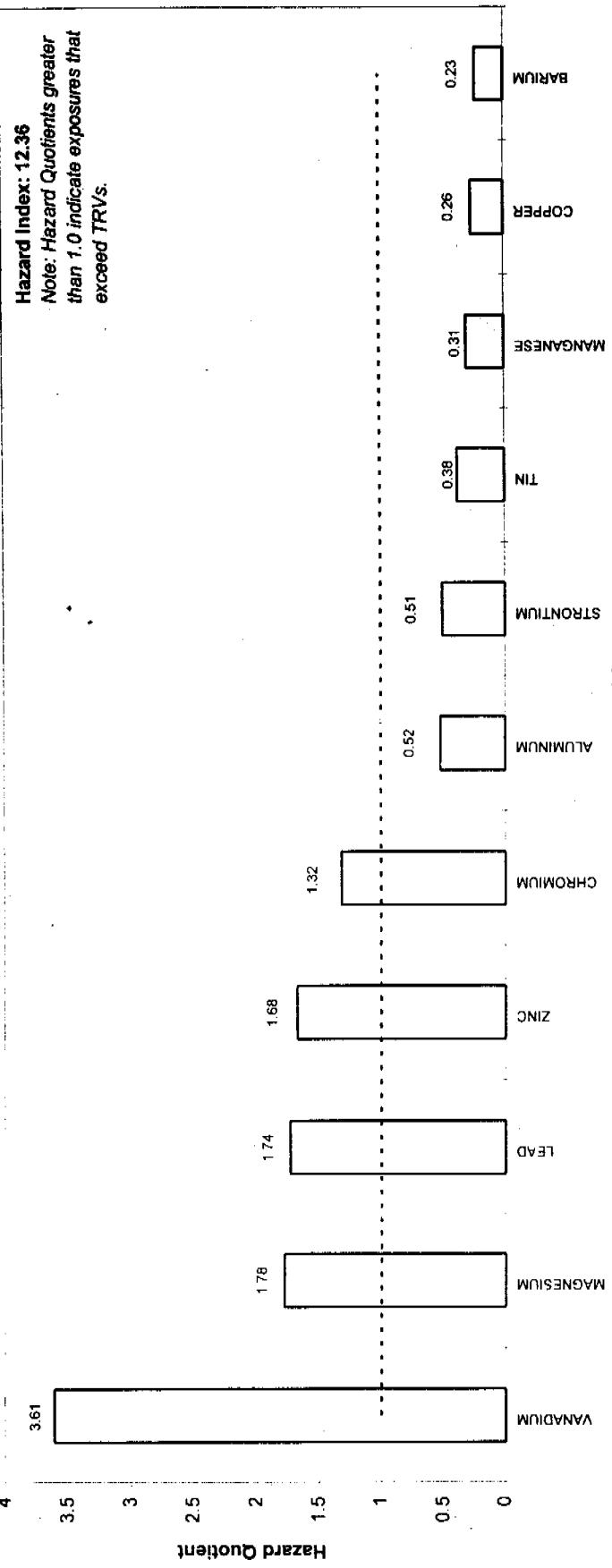
Summary of Ecotoxicological Risk to American Kestrels in the 903 Pad Source Area at RFETS

AMERICAN KESTREL 903 PAD		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte ¹	PCOC for OU2	IR = 0.14, SUF = 0.733	UCL ₉₅ , Intake	IR = 0.15, SUF = 0.733	UCL ₉₅ , Intake	UCI ₉₅ , Intake	IR = 0.00812, SUF = 0.733				
CHROMIUM	X	5.03	0.52	131.00	19.66	26.79	0.16	20.33	2.21	9.21	64.22%
LITHIUM	NR	—	NR	—	13.59	0.08	0.08	0.10	0.81	0.69	5.62%
THALLIUM	NR	—	NR	—	0.87	0.01	0.01	0.01	0.69	0.79	4.79%
COBALT	NR	—	NR	—	7.67	0.05	0.05	0.08	0.60	0.60	4.15%
ZINC	154.35	15.84	NC	—	72.70	0.43	16.27	32.10	0.51	0.51	3.54%
BERYLLIUM	NR	—	NR	—	1.29	0.01	0.01	0.02	0.50	0.50	3.47%
ALUMINUM	NR	—	NR	—	11886.18	70.75	70.75	147.66	0.48	0.48	3.34%
SELENIUM	3.11	0.32	ND	—	0.68	4.03E-03	0.32	0.82	0.39	0.39	2.75%
VANADIUM	NR	—	NR	—	35.68	0.21	0.21	0.62	0.34	0.34	2.41%
LEAD	X	5.39	0.55	ND	—	32.37	0.19	0.75	3.85	0.19	1.35%
MANGANESE	NR	—	NR	—	318.24	1.89	1.89	21.09	0.09	0.09	0.63%
CADMIUM	2.63	0.27	ND	—	1.29	0.01	0.28	3.12	0.09	0.09	0.62%
MAGNESIUM	NR	—	NR	—	3426.35	20.39	20.39	234.76	0.09	0.09	0.61%
COPPER	16.63	1.71	NC	—	21.82	0.13	1.84	33.68	0.05	0.05	0.38%
PHENANTHRENE	X	NR	—	NR	—	0.56	3.31E-03	3.31E-03	0.08	0.04	0.30%
BARIUM	NR	—	NR	—	143.68	0.86	0.86	21.16	0.04	0.04	0.28%
MERCURY	ND	—	ND	—	0.08	4.52E-04	4.52E-04	0.01	0.03	0.03	0.23%
BENZO(a)PYRENE	X	NR	—	NR	—	0.32	1.91E-03	1.91E-03	0.08	0.02	0.17%
BENZO(k) FLUORANTHENE	X	NR	—	NR	—	0.31	1.85E-03	1.85E-03	0.08	0.02	0.17%
STRONTIUM	NR	—	NR	—	43.04	0.26	0.26	14.15	0.02	0.02	0.13%
Di-n-BUTYL PHTHALATE	X	NR	—	NR	—	0.35	2.10E-03	2.10E-03	0.12	0.02	0.12%
ANTHRACENE	NR	—	NR	—	0.20	1.19E-03	1.19E-03	0.08	0.02	0.02	0.11%
DIBENZO(a,h)ANTHRACENE	NR	—	NR	—	0.18	1.07E-03	1.07E-03	0.08	0.01	0.01	0.10%
ARSENIC	NR	—	NR	—	4.00	0.02	0.02	1.85	0.01	0.01	0.09%
MOLYBDENUM	NR	—	NR	—	4.98	0.03	0.03	2.50	0.01	0.01	0.08%
NITRATE/NITRITE	NR	—	NR	—	3.11	0.02	0.02	2.01	0.01	0.01	0.06%
TIN	NR	—	NR	—	33.32	0.20	0.20	23.39	0.01	0.01	0.06%
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	—	0.19	1.12E-03	1.12E-03	0.19	0.01	0.04%
FLUORANTHENE	X	NR	—	NR	—	0.69	4.10E-03	4.10E-03	0.78	0.01	0.04%
PYRENE	X	NR	—	NR	—	0.64	3.83E-03	3.83E-03	0.78	<0.01	0.03%
AROCLOR-1254	X	NR	—	NR	—	0.21	1.24E-03	1.24E-03	0.36	<0.01	0.02%
CHRYSENE	X	NR	—	NR	—	0.34	2.03E-03	2.03E-03	0.78	<0.01	0.02%
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	0.34	2.00E-03	2.00E-03	0.77	<0.01	0.02%
BENZO(a)ANTHRACENE	X	NR	—	NR	—	0.33	1.99E-03	1.99E-03	0.78	<0.01	0.02%
BENZO(ghi)PERYLENE	X	NR	—	NR	—	0.19	1.14E-03	1.14E-03	0.78	<0.01	0.01%
FLUORENE	NR	—	NR	—	0.19	1.13E-03	1.13E-03	0.77	<0.01	0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	—	0.25	1.48E-03	1.48E-03	1.20	<0.01	0.01%
NICKEL	NR	—	NR	—	26.99	0.16	0.16	146.12	<0.01	0.01%	
ACENAPHTHEN	NR	—	NR	—	0.19	1.11E-03	1.11E-03	77.63	<0.01	<0.01%	

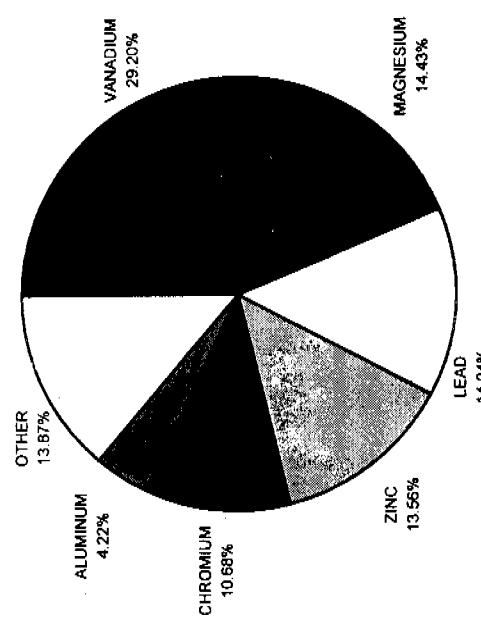
¹ Chromium concentrations in terrestrial arthropods estimated from tissue:soil ratios in East Trenches source area.

Summary of Ecotoxicological Risk to American Kestrels in the A-Ponds Source Area at RFETS

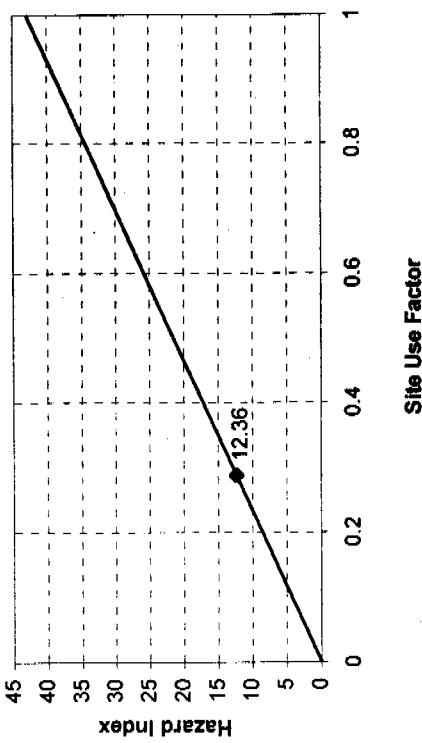
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk



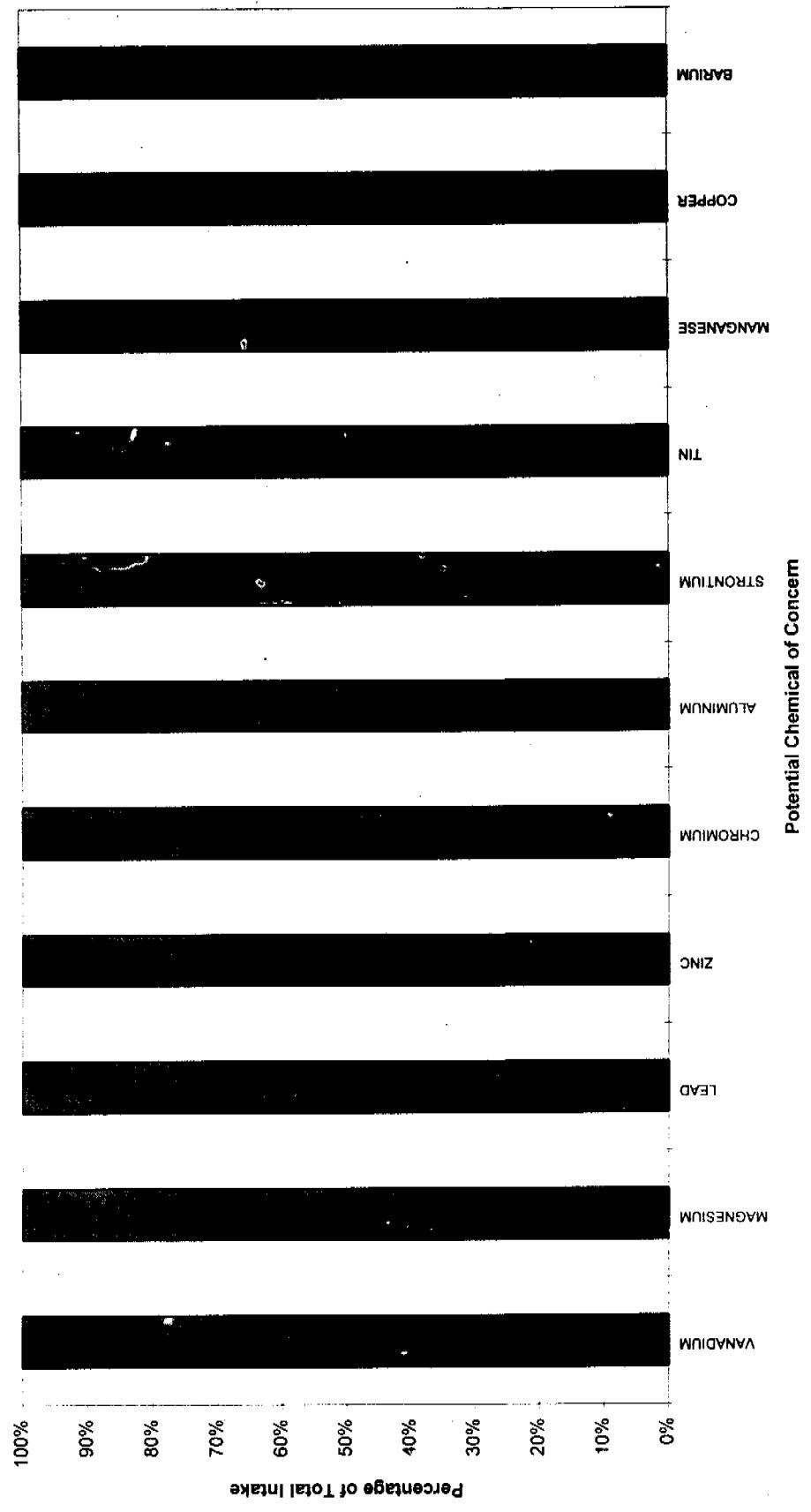
Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the A-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Small Mammal Intake ■ Terrestrial Ath. Intake □ Surficial Soil Intake



Summary of Ecotoxicological Risk to American Kestrels in the A-Ponds Source Area at RFET's

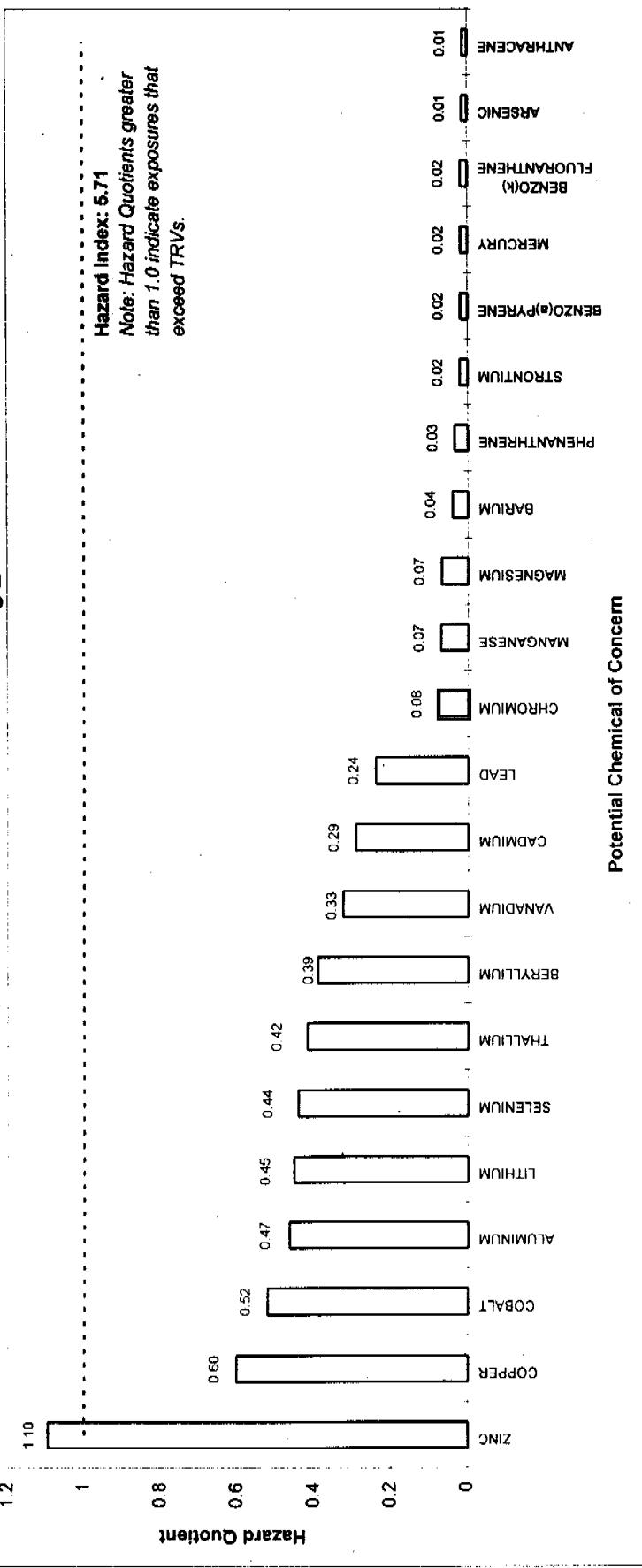
AMERICAN KESTREL A-PONDS		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Reference Value	Hazard Quotient	Percent of Total Risk
		UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₄₅	Intake				
Analyte	PCOC for this OJ6	IR = 0.29	SUF = 0.287	IR = I	SUF = I	IR = 0.00812	SUF = 0.287				
VANADIUM	X	26.71	2.22	NR	—	NC	—	2.22	0.62	3.61	29.20%
MAGNESIUM	X	5030.43	418.68	NR	—	NC	—	418.68	234.76	1.78	14.43%
LEAD	X	80.28	6.68	NR	—	NC	—	6.68	3.85	1.74	14.04%
ZINC	X	646.55	53.81	NR	—	NC	—	53.81	32.10	1.68	13.56%
CHROMIUM	X	35.03	2.92	NR	—	NC	—	2.92	2.21	1.32	10.68%
ALUMINUM		925.17	77.00	NR	—	NC	—	77.00	147.66	0.52	4.22%
STRONTIUM	X	85.89	7.15	NR	—	NC	—	7.15	14.15	0.51	4.09%
TIN		107.61	8.96	NR	—	NC	—	8.96	23.39	0.38	3.10%
MANGANESE	X	77.29	6.43	NR	—	NC	—	6.43	21.09	0.31	2.47%
COPPER	X	106.49	8.86	NR	—	NC	—	8.86	33.68	0.26	2.13%
BARIUM	X	57.80	4.81	NR	—	NC	—	4.81	21.16	0.23	1.84%
NICKEL	X	54.10	4.50	NR	—	NC	—	4.50	146.12	0.03	0.25%
SILVER	X	14.72	1.23	NR	—	ND	—	1.23	2304.90	<0.01	<0.01%

HAZARD INDEX 12.36

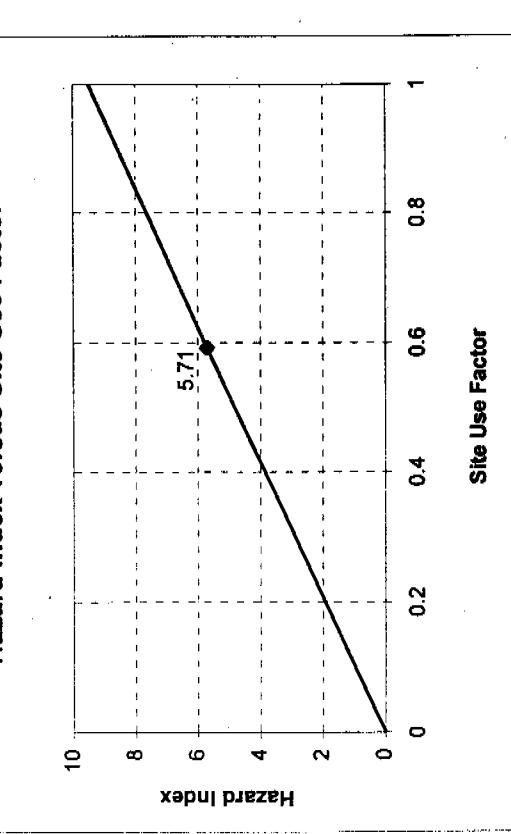
¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

Summary of Ecotoxicological Risk to American Kestrels in the 881 Hillside Source Area at RFETS

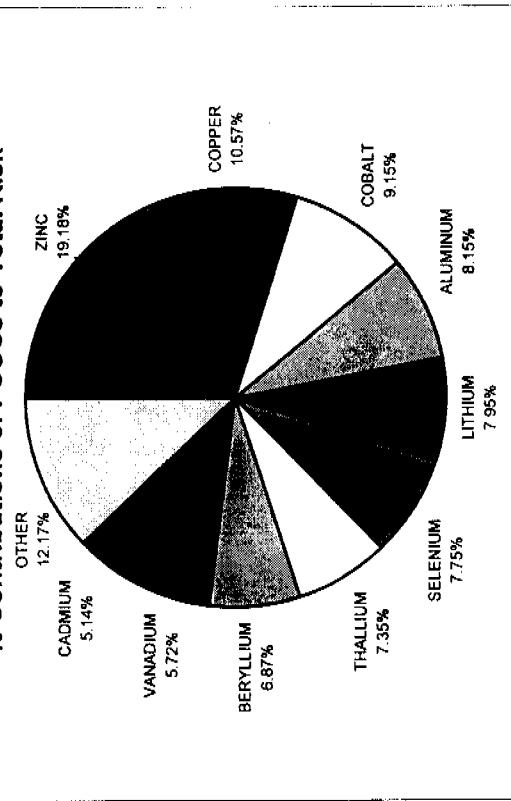
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



Hazard Index versus Site Use Factor



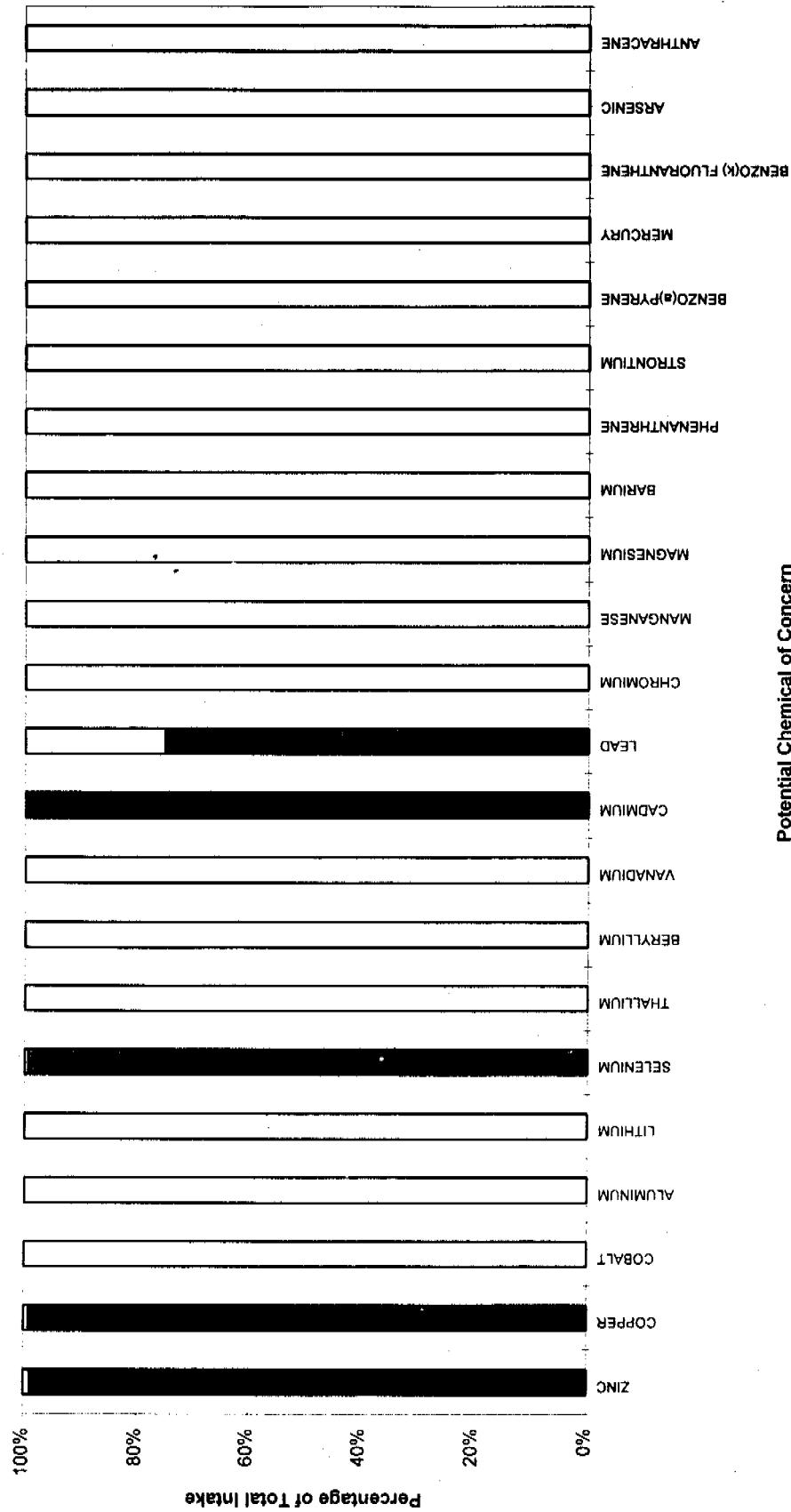
% Contributions of PCOCs to Total Risk



Summary of Ecotoxicological Risk to American Kestrels in the 881 Hillside Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Small Mammal Intake ■ Terrestrial Ath. Intake □ Surficial Soil Intake



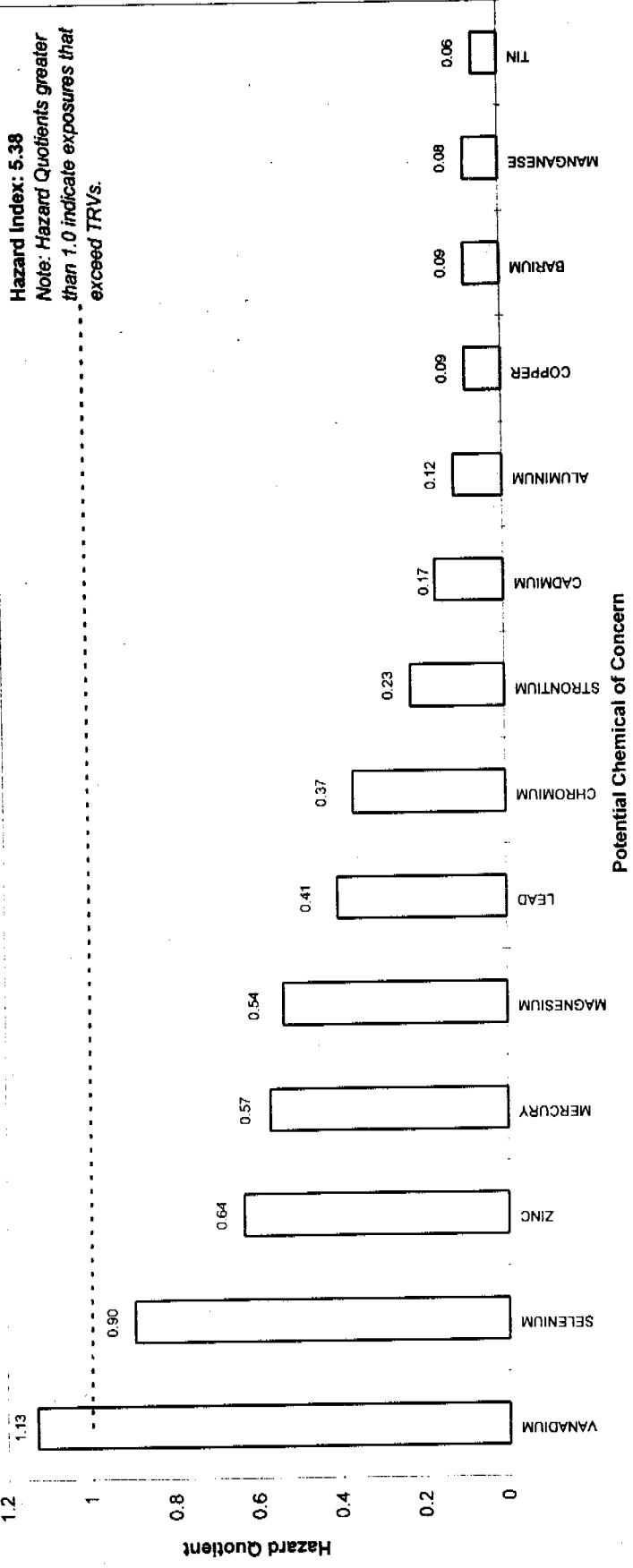
Summary of Ecotoxicological Risk to American Kestrels in the 881 Hillside Source Area at RFETS

AMERICAN KESTREL 881 HILLSIDE		EXPOSURE POINT						SUMMARY			
Analyte	PCOC for OU1	Small Mammal		Terrestrial Arth.		Surficial Soil		Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
		UCL ₉₅ IR = 0.14	Intake SUF = 0.592	UCL ₉₅ IR = 0.15	Intake SUF = 0.592	UCL ₉₅ IR = 0.00812	Intake SUF = 0.592				
ZINC		159.13	13.19	242.98	21.58	85.55	0.41	35.18	32.10	1.10	19.18%
COPPER		81.05	6.72	151.48	13.45	35.48	0.17	20.34	33.68	0.60	10.57%
COBALT		NR	—	NR	—	8.34	0.04	0.08	0.52	9.15%	
ALUMINUM		NR	—	NR	—	14308.32	68.78	147.66	0.47	8.15%	
LITHIUM		NR	—	NR	—	9.47	0.05	0.05	0.45	7.95%	
SELENIUM		NR	—	NR	—	0.51	2.46E-03	0.36	0.44	7.75%	
THALLIUM		4.35	0.36	ND	—	0.66	3.15E-03	3.15E-03	0.01	0.42	7.35%
BERYLLIUM		NR	—	NR	—	NR	—	1.26	0.01	0.02	0.39
VANADIUM		NR	—	NR	—	NR	—	41.86	0.20	0.62	0.33
CADMIUM		NR	—	NR	—	NR	—	4.57	0.41	0.61	2.94E-03
LEAD		6.11	0.51	3.26	0.29	48.00	0.23	312.55	1.50	1.50	0.08
CHROMIUM		4.95	0.41	ND	—	3418.57	16.43	16.43	21.09	0.07	5.72%
MANGANESE	X	NR	—	NR	—	NR	—	179.14	0.86	0.86	234.76
MAGNESIUM		NR	—	NR	—	NR	—	0.56	2.69E-03	2.69E-03	0.04
BARIUM		NR	—	NR	—	NR	—	61.65	0.30	0.30	1.33%
PHENANTHRENE		NR	—	NR	—	NR	—	0.31	1.50E-03	1.50E-03	-
STRONTIUM		NR	—	NR	—	NR	—	0.05	2.59E-04	2.59E-04	0.02
BENZO(a)PYRENE	X	NR	—	NR	—	NR	—	0.30	1.43E-03	1.43E-03	0.02
MERCURY		ND	—	ND	—	NR	—	5.38	0.03	0.03	0.34%
BENZO(k) FLUORANTHENE	X	NR	—	NR	—	NR	—	0.20	9.73E-04	9.73E-04	0.01
ARSENIC		NR	—	NR	—	NR	—	0.19	9.08E-04	9.08E-04	0.01
ANTHRACENE	X	NR	—	NR	—	NR	—	43.09	0.21	0.21	0.02
DIBENZO(a,h)ANTHRACENE	X	NR	—	NR	—	NR	—	2.11	•0.01	0.01	0.33%
TIN		NR	—	NR	—	NR	—	0.20	9.79E-04	9.79E-04	0.01
NITRATE/NITRITE		NR	—	NR	—	NR	—	0.19	0.78	<0.01	0.22%
INDENO(1,2,3- α)PYRENE	X	NR	—	NR	—	NR	—	2.11	0.21	0.21	0.01
FLUORANTHENE	X	NR	—	NR	—	NR	—	0.20	0.01	0.01	0.16%
PYRENE	X	NR	—	NR	—	NR	—	0.76	3.66E-03	3.66E-03	0.01
MOLYBDENUM	X	NR	—	NR	—	NR	—	0.69	3.33E-03	3.33E-03	0.01
AROCLOR-1254	X	NR	—	NR	—	NR	—	1.93	0.01	0.01	0.08%
CHRYSENE	X	NR	—	NR	—	NR	—	0.26	1.24E-03	1.24E-03	<0.01
BENZO(a)ANTHRACENE	X	NR	—	NR	—	NR	—	0.36	1.73E-03	1.73E-03	0.36
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	NR	—	0.33	1.57E-03	1.57E-03	<0.01
BENZO(g,h)PERYLENE	X	NR	—	NR	—	NR	—	0.31	1.51E-03	1.51E-03	0.78
FLORENE	X	NR	—	NR	—	NR	—	0.21	9.87E-04	9.87E-04	0.77
NICKEL	X	NR	—	NR	—	NR	—	0.19	9.27E-04	9.27E-04	0.77
ACENAPHTHENE	X	NR	—	NR	—	NR	—	29.86	0.14	0.14	146.12
NAPHTHALENE	X	NR	—	NR	—	NR	—	0.19	9.37E-04	9.37E-04	77.63
		NR	—	NR	—	NR	—	0.19	9.36E-04	9.36E-04	77.63

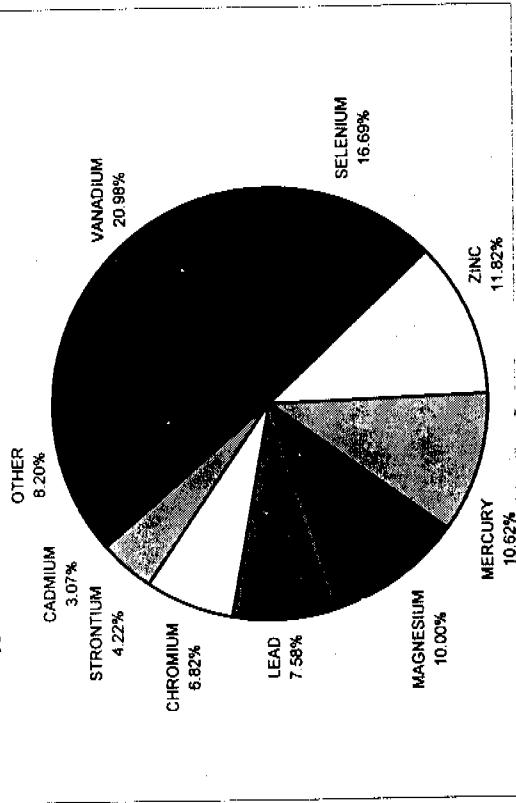
HAZARD INDEX 5.71

Summary of Ecotoxicological Risk to American Kestrels in the OU7 Downgradient Areas Source Area at RFETS

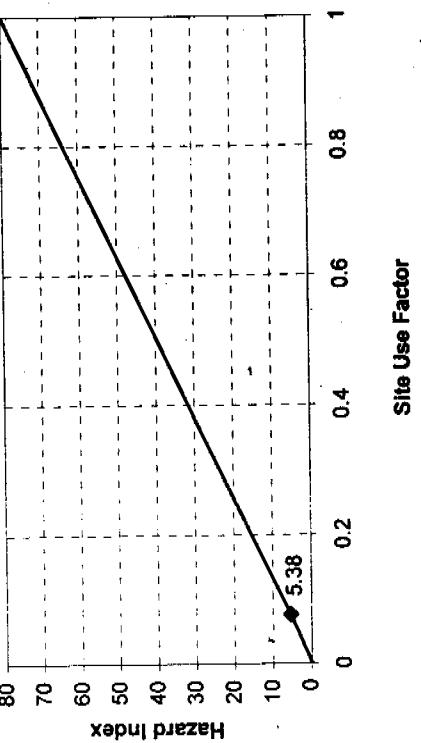
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

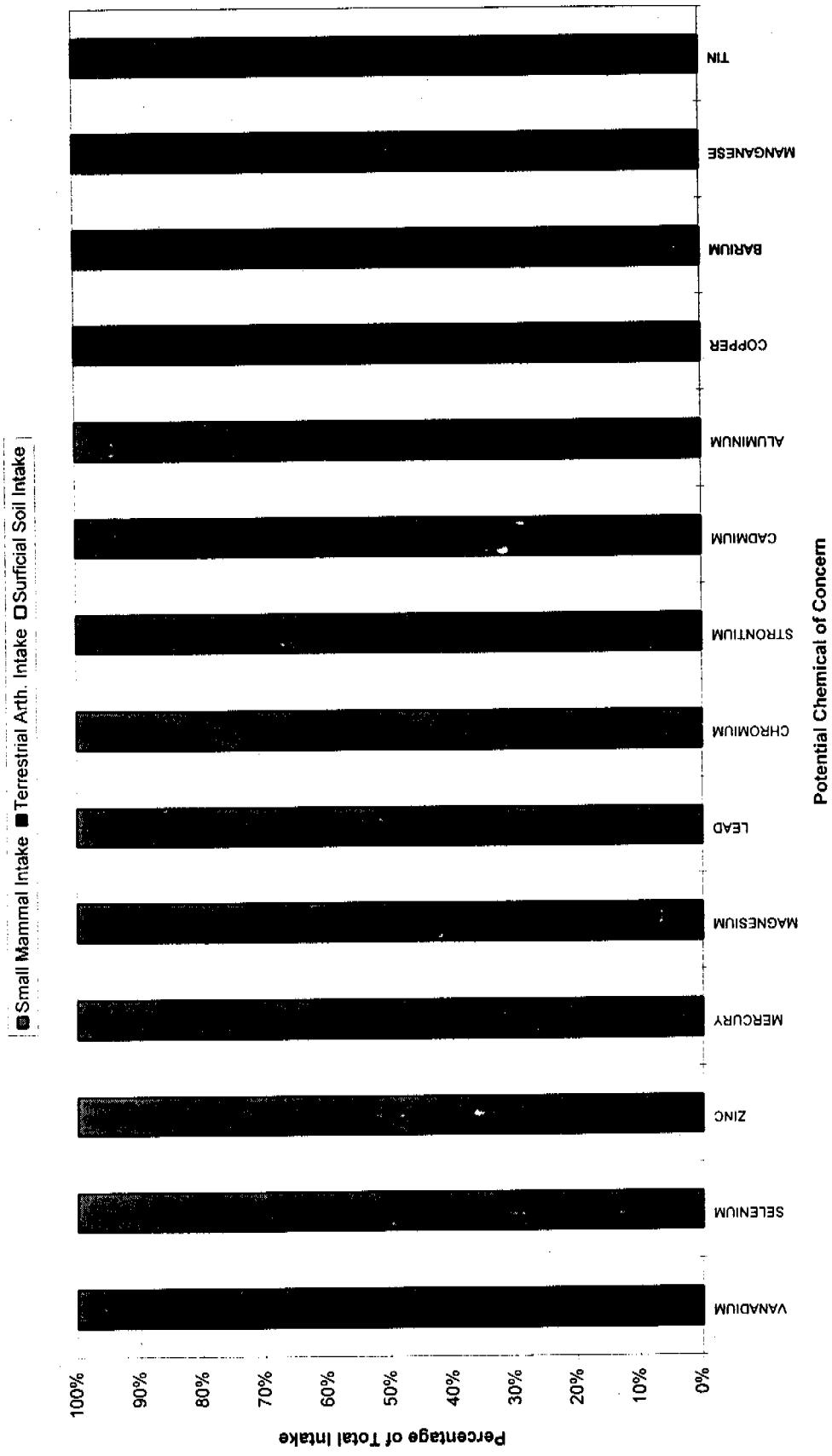


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the OU7 Downgradient Areas Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to American Kestrels in the OU7 Downgradient Areas Source Area at RFETS

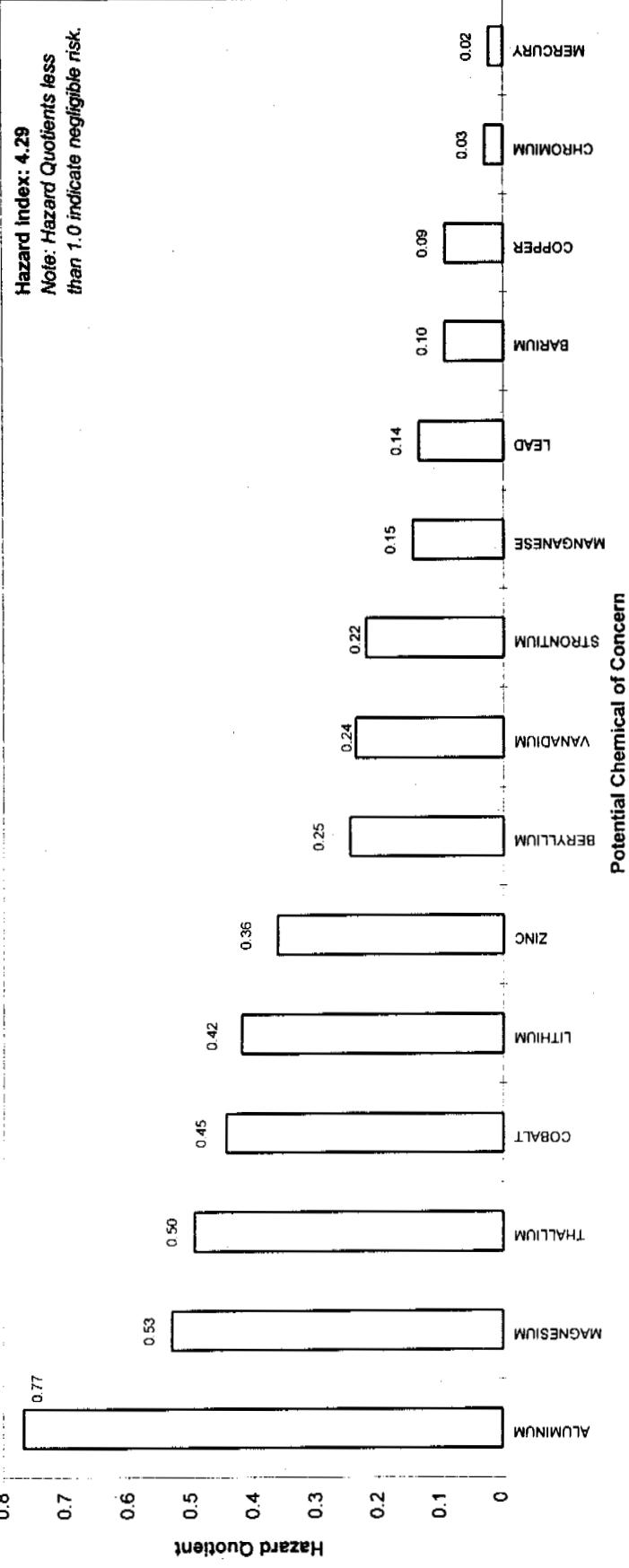
AMERICAN KESTREL OU7 DOWNGRADIENT AREAS		EXPOSURE POINT ¹						SUMMARY					
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
Analyte	PCOC for OU7	IR = 0.29 SUF = 0.075	UCL ₉₅	Intake	UCL ₉₅ IR = I SUF = I	UCL ₉₅	Intake	UCL ₉₅ IR = 0.00812 SUF = 0.075	—	0.70	0.62	1.13	20.98%
VANADIUM	X	31.98	0.70	NR	—	NR	—	—	0.70	0.62	1.13	20.98%	
SELENIUM	X	33.86	0.74	NR	—	NR	—	0.74	0.82	0.90	0.90	16.63%	
ZINC	X	938.96	20.42	NR	—	NR	—	20.42	32.10	0.64	0.64	11.82%	
MERCURY	X	0.36	0.01	NR	—	NR	—	0.01	—	0.01	0.01	10.62%	
MAGNESIUM	X	5812.75	126.43	NR	—	NR	—	126.43	234.76	0.54	0.54	10.00%	
LEAD	X	72.19	1.57	NR	—	NR	—	1.57	3.85	0.41	0.41	7.58%	
CHROMIUM	X	37.27	0.81	NR	—	NR	—	0.81	2.21	0.37	0.37	6.82%	
STRONTIUM	X	147.72	3.21	NR	—	NR	—	3.21	14.15	0.23	0.23	4.22%	
CADMIUM	X	23.67	0.51	NR	—	NR	—	0.51	3.12	0.17	0.17	3.07%	
ALUMINUM	X	798.32	17.36	NR	—	NR	—	17.36	147.66	0.12	0.12	2.18%	
COPPER	X	135.22	2.94	NR	—	NR	—	2.94	33.68	0.09	0.09	1.62%	
BARIUM	X	84.54	1.84	NR	—	NR	—	1.84	21.16	0.09	0.09	1.61%	
MANGANESE	X	81.47	1.77	NR	—	NR	—	1.77	21.09	0.08	0.08	1.56%	
TIN	X	66.89	1.45	NR	—	NR	—	1.45	23.39	0.06	0.06	1.16%	
NITRATE/NITRITE	X	NR	—	NR	—	10.78	0.01	0.01	2.01	<0.01	0.06%		
SILVER		30.35	0.66	NR	—	NR	—	0.66	2304.90	<0.01	0.01%		

HAZARD INDEX 5.38

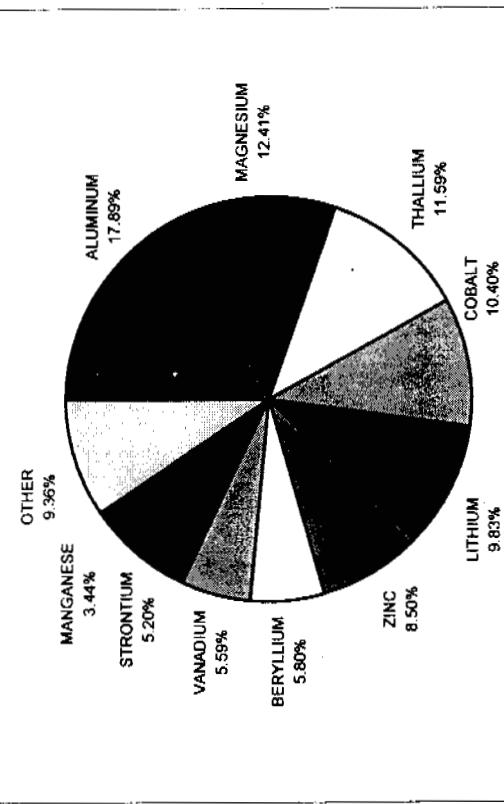
¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

Summary of Ecotoxicological Risk to American Kestrels in the Ash Pits Source Area at RFETs

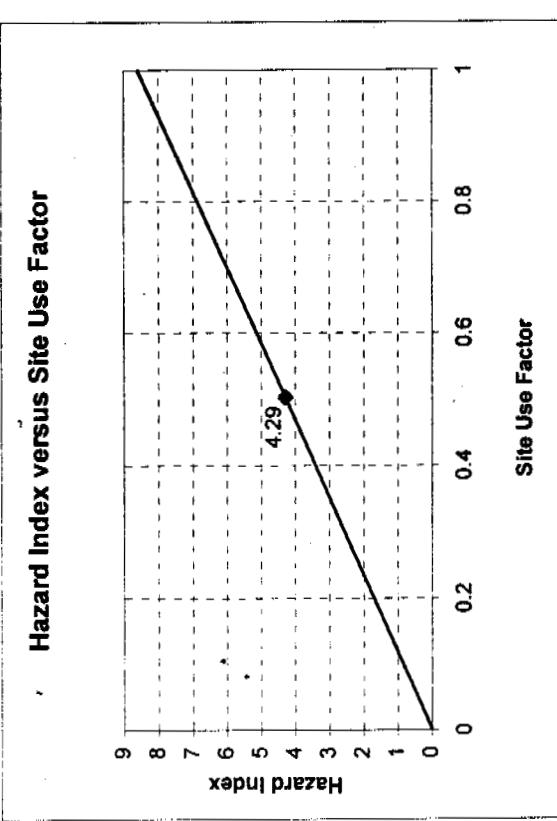
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

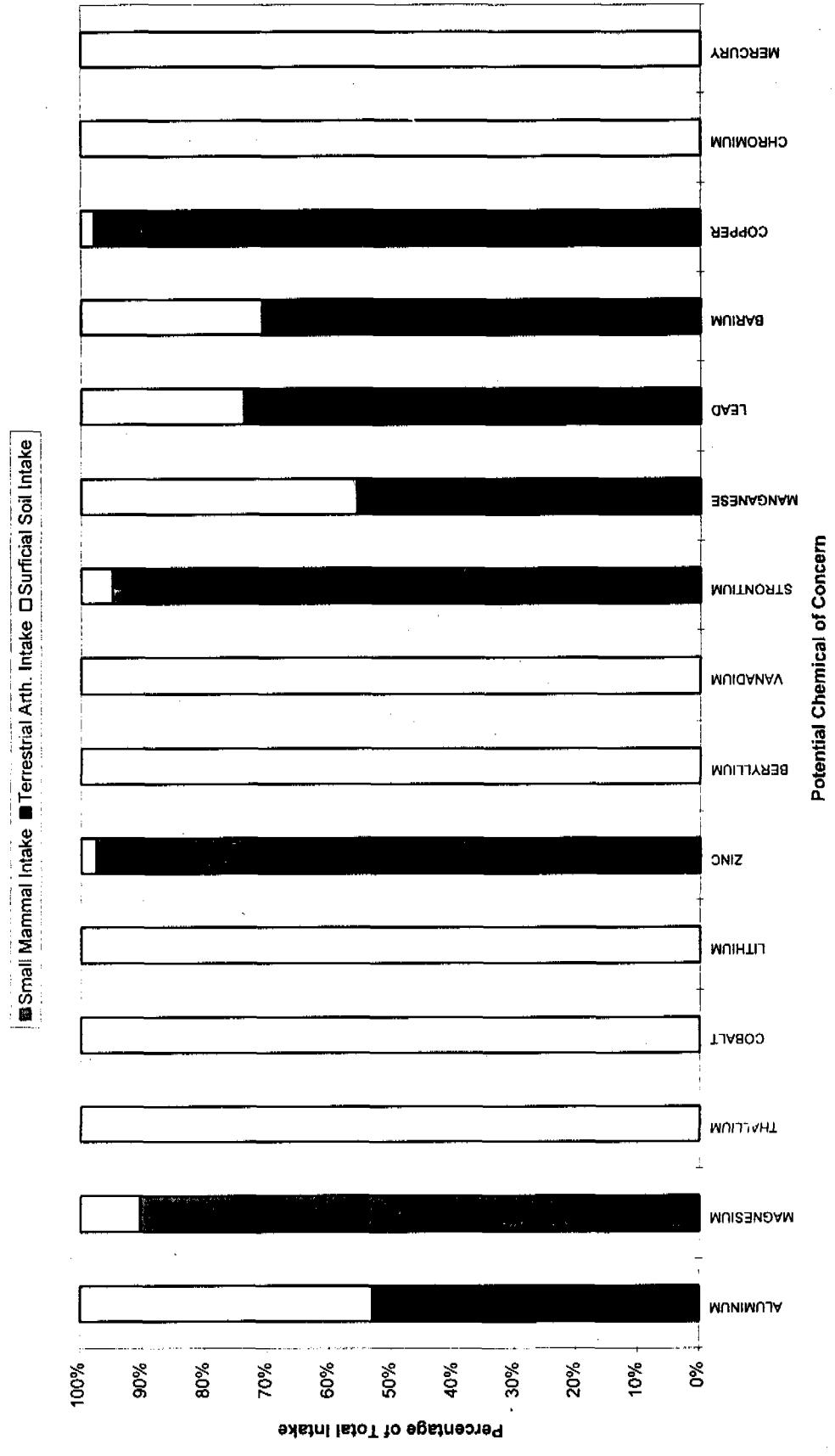


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the Ash Pits Source Area at RFETS

Contribution of Exposure Points to Total Intake



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23
Summary of Ecotoxicological Risk to American Kestrels in the Ash Pits Source Area at RFETs

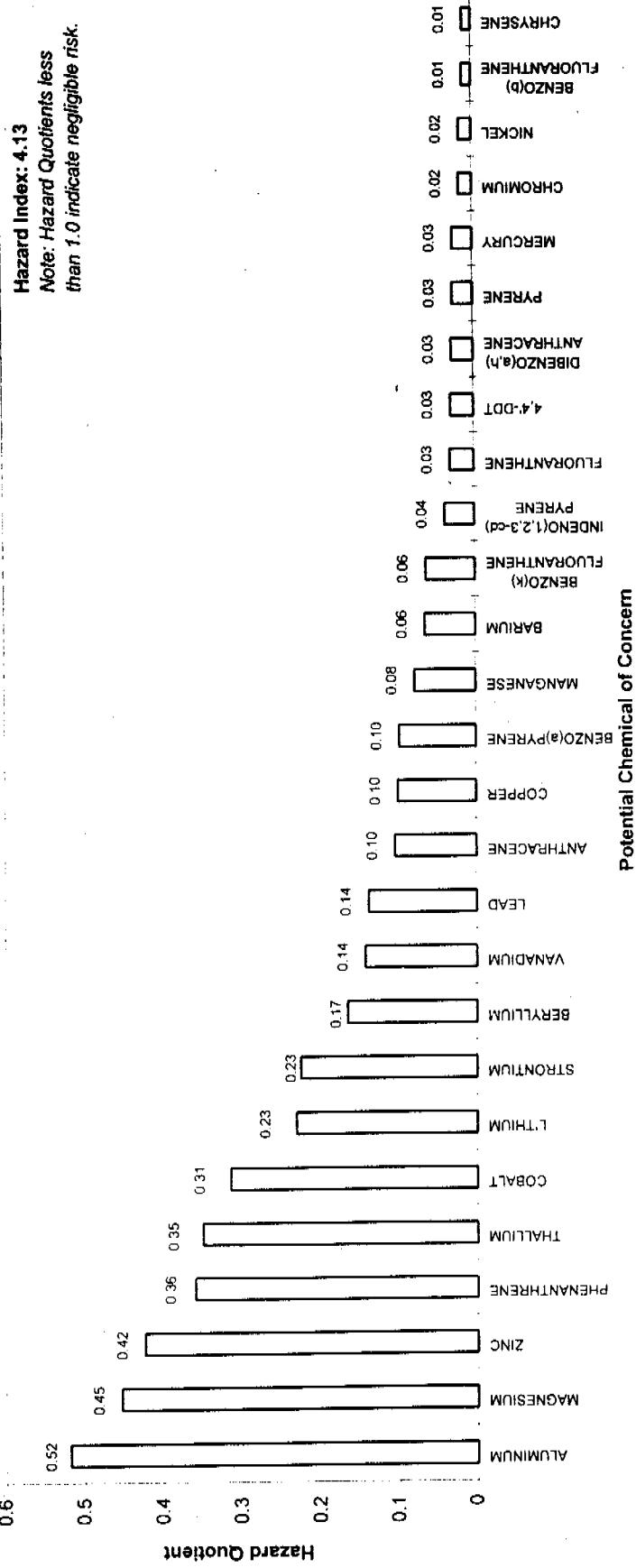
AMERICAN KESTREL ASH PITS		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OUS	IR = 0.29	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00812	SUF = 0.502	IR = 0.502
ALUMINUM		413.42	60.19	NR	—	13038.84	53.15	113.33	147.66	0.77	17.89%
MAGNESIUM		776.81	113.09	NR	—	2929.96	11.94	125.03	234.76	0.53	12.41%
THALLIUM	X	ND	—	NR	—	0.91	3.73E-03	3.73E-03	0.01	0.50	11.59%
COBALT	X	ND	—	NR	—	8.40	0.03	0.03	0.08	0.45	10.40%
LITHIUM	X	ND	—	NR	—	10.38	0.04	0.04	0.10	0.42	9.83%
ZINC	X	78.51	11.43	NR	—	69.63	0.28	11.71	32.10	0.36	8.50%
BERYLLIUM		ND	—	NR	—	0.94	3.83E-03	3.83E-03	0.02	0.25	5.80%
VANADIUM		ND	—	NR	—	36.21	0.15	0.15	0.62	0.24	5.59%
STRONTIUM	X	20.61	3.00	NR	—	38.77	0.16	3.16	14.15	0.22	5.20%
MANGANESE		11.94	1.74	NR	—	337.52	1.38	3.11	21.09	0.15	3.44%
LEAD	X	2.69	0.39	NR	—	33.78	0.14	0.53	3.85	0.14	3.21%
BARIUM	X	9.86	1.44	NR	—	143.89	0.59	2.02	21.16	0.10	2.23%
COPPER	X	21.42	3.12	NR	—	16.94	0.07	3.19	33.68	0.09	2.21%
CHROMIUM		ND	—	NR	—	15.96	0.07	0.07	2.21	0.03	0.69%
MERCURY	X	ND	—	NR	—	0.08	3.17E-04	3.17E-04	0.01	0.02	0.54%
ARSENIC		ND	—	NR	—	5.72	0.02	0.02	1.85	0.01	0.29%
TIN		ND	—	NR	—	16.66	0.07	0.07	23.39	<0.01	0.07%
SELENIUM		ND	—	NR	—	0.41	1.67E-03	1.67E-03	0.82	<0.01	0.05%
CADMIUM		ND	—	NR	—	1.35	0.01	0.01	3.12	<0.01	0.04%
MOLYBDENUM		ND	—	NR	—	0.93	3.78E-03	3.78E-03	2.50	<0.01	0.04%
NICKEL		ND	—	NR	—	13.58	0.06	0.06	146.12	<0.01	0.01%
SILVER	X	ND	—	NR	—	1.81	0.01	0.01	2304.90	<0.01	<0.01%

HAZARD INDEX 4.29

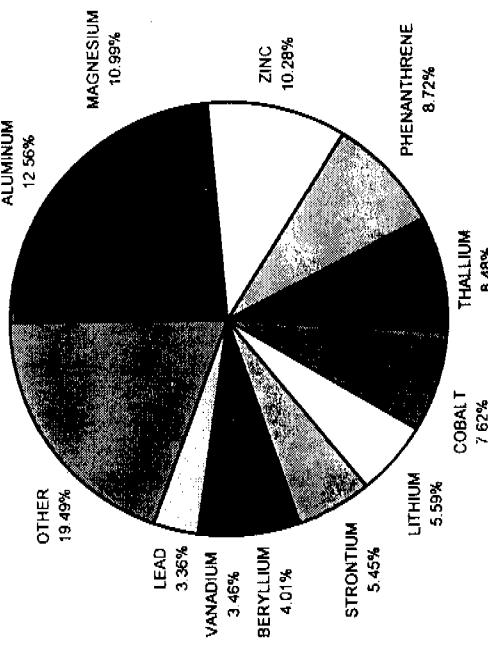
¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

Summary of Ecotoxicological Risk to American Kestrels in the Old Landfill Source Area at RFETS

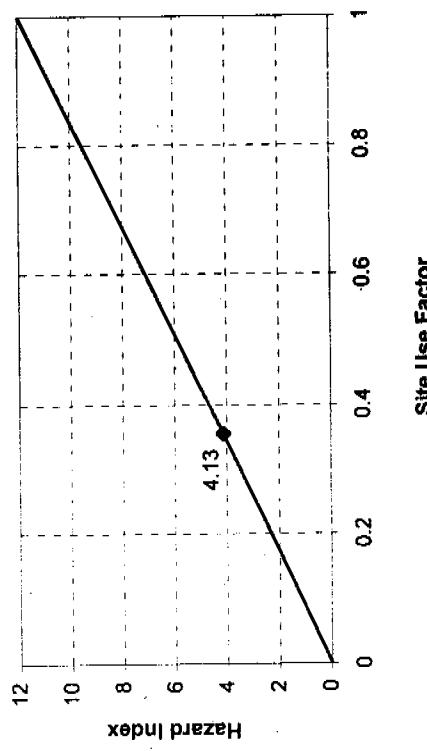
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

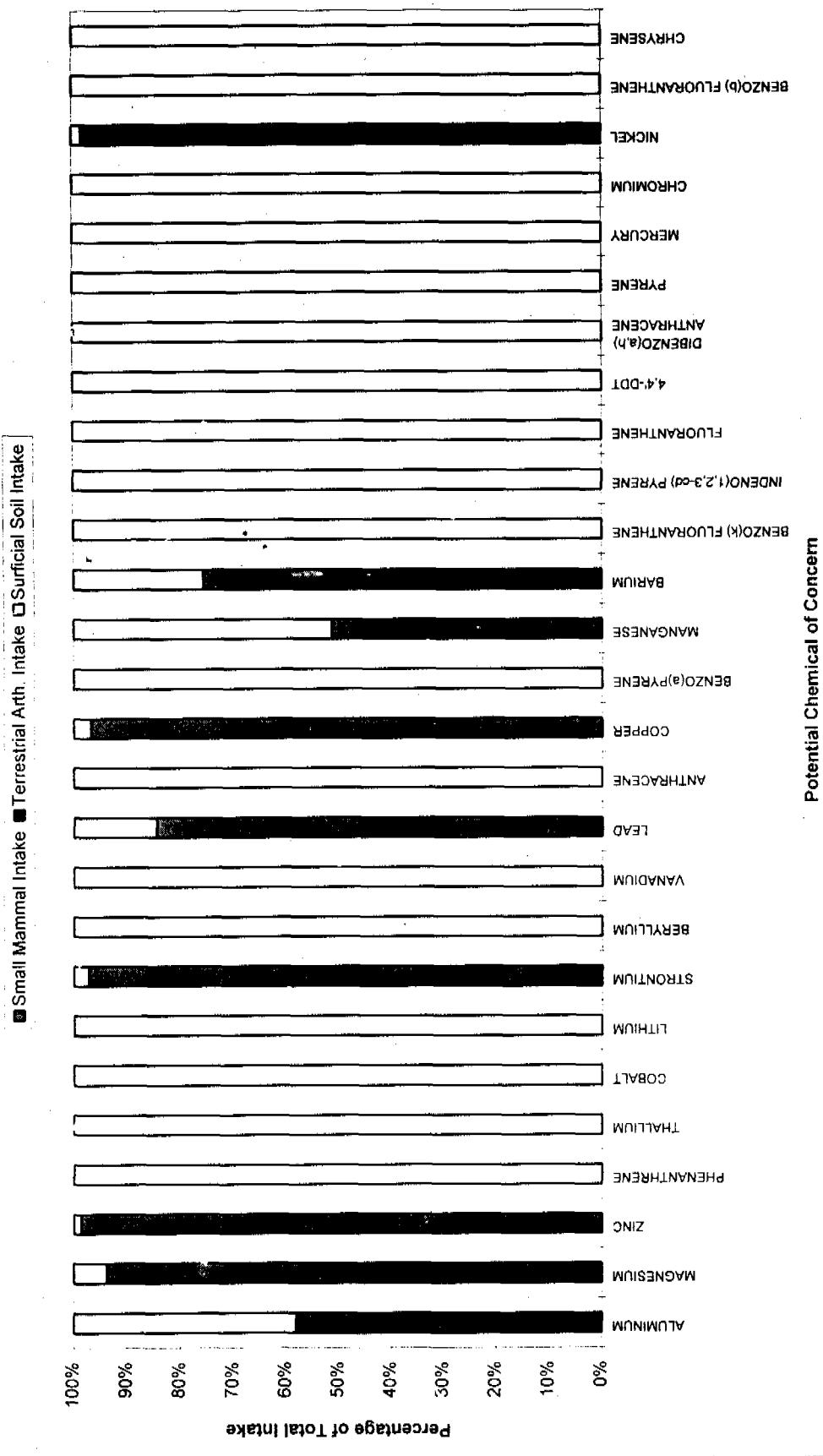


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the Old Landfill Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to American Kestrels in the Old Landfill Source Area at RFETS

AMERICAN KESTREL OLD LANDFILL		EXPOSURE POINT ¹						SUMMARY					
		Small Mammal			Terrestrial Arth.			Surficial Soil			Toxicity		
		UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	Total Intake	Reference Value	Quotient	
ANALYTE	PCOC for OUS	IR = 0.29 SUF = 0.356	IR = I SUF = I	IR = 1 SUF = 1	IR = 0.00812 SUF = 0.356								
ALUMINUM		431.43	44.54	NR	—	11074.66	32.01	76.55	147.66	0.52	12.56%		
MAGNESIUM		967.47	99.88	NR	—	2298.53	6.64	106.53	234.76	0.45	10.99%		
ZINC	X	130.10	13.43	NR	—	66.57	0.19	13.62	32.10	0.42	10.28%		
PHENANTHRENE	X	NR	—	NR	—	9.64	0.03	0.03	0.08	0.36	8.72%		
THALLIUM		ND	—	NR	—	0.91	2.63E-03	2.63E-03	0.01	0.35	8.48%		
COBALT	X	ND	—	NR	—	8.35	0.02	0.02	0.08	0.31	7.62%		
LITHIUM	X	ND	—	NR	—	8.00	0.02	0.02	0.10	0.23	5.59%		
STRONTIUM	X	29.98	3.10	NR	—	30.81	0.09	3.18	14.15	0.23	5.45%		
BERYLLIUM		ND	—	NR	—	0.88	2.55E-03	2.55E-03	0.02	0.17	4.01%		
VANADIUM		ND	—	NR	—	30.43	0.09	0.09	0.62	0.14	3.46%		
LEAD	X	4.36	0.45	NR	—	28.70	0.08	0.53	3.85	0.14	3.36%		
ANTHRACENE	X	NR	—	NR	—	2.82	0.01	0.01	0.08	0.10	2.54%		
COPPER	X	31.63	3.27	NR	—	37.70	0.11	3.37	33.68	0.10	2.43%		
BENZO(a)PYRENE	X	NR	—	NR	—	2.64	0.01	0.01	0.08	0.10	2.38%		
MANGANESE		8.23	0.85	NR	—	277.66	0.80	1.65	21.09	0.08	1.90%		
BARIUM	X	10.07	1.04	NR	—	115.59	0.33	1.37	21.16	0.06	1.57%		
BENZO(k)FLUORANTHENE	X	NR	—	NR	—	1.69	4.90E-03	4.90E-03	0.08	0.06	1.53%		
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	—	2.57	0.01	0.01	0.19	0.04	0.93%		
FLUORANTHENE	X	NR	—	NR	—	8.27	0.02	0.02	0.78	0.03	0.75%		
4,4'-DDT	X	NR	—	NR	—	0.01	2.49E-05	2.49E-05	8.34E-04	0.03	0.72%		
DIBENZO(a,h)ANTHRACENE	X	NR	—	NR	—	0.76	2.19E-03	2.19E-03	0.08	0.03	0.68%		
PYRENE	X	NR	—	NR	—	7.09	0.02	0.02	0.78	0.03	0.64%		
MERCURY	X	ND	—	NR	—	0.12	3.58E-04	3.58E-04	0.01	0.03	0.63%		
CHROMIUM		ND	—	NR	—	13.09	0.04	0.04	2.21	0.02	0.42%		
NICKEL		22.57	2.33	NR	—	14.94	0.04	2.37	146.12	0.02	0.39%		
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	3.18	• 0.01	0.01	0.77	0.01	0.29%		
CHRYSENE	X	NR	—	NR	—	2.99	• 0.01	0.01	0.78	0.01	0.27%		
BENZO(a)ANTHRACENE	X	NR	—	NR	—	2.85	0.01	0.01	0.78	0.01	0.26%		
ARSENIC		ND	—	NR	—	5.70	0.02	0.02	1.85	0.01	0.22%		
FLUORENE	X	NR	—	NR	—	2.36	0.01	0.01	0.77	0.01	0.21%		
MOLYBDENUM		ND	—	NR	—	7.35	0.02	0.02	2.50	0.01	0.21%		
DI-n-BUTYL PHthalATE	X	NR	—	NR	—	0.31	9.04E-04	9.04E-04	0.12	0.01	0.18%		
ACROCLOR-1254	X	NR	—	NR	—	0.57	1.65E-03	1.65E-03	0.36	<0.01	0.11%		
BENZO(ghi)PERYLENE	X	NR	—	NR	—	0.92	2.67E-03	2.67E-03	0.78	<0.01	0.08%		
HEPTACHLOR EPOXIDE	X	NR	—	NR	—	0.00	1.24E-05	1.24E-05	0.01	<0.01	0.04%		
SELENIUM		ND	—	NR	—	0.46	1.33E-03	1.33E-03	0.82	<0.01	0.04%		
TIN		ND	—	NR	—	9.71	0.03	0.03	23.39	<0.01	0.03%		
CADMIUM		ND	—	NR	—	0.88	2.54E-03	2.54E-03	3.12	<0.01	0.02%		
BIS(2-ETHYLHEXYL)PHthalATE	X	NR	—	NR	—	0.30	8.81E-04	8.81E-04	1.20	<0.01	0.02%		
DIELDREN	X	NR	—	NR	—	0.01	2.67E-05	2.67E-05	0.12	<0.01	0.01%		
ALDRIN	X	NR	—	NR	—	0.00	1.35E-05	1.35E-05	0.12	<0.01	<0.01%		
ACENAPHTHENE	X	NR	—	NR	—	2.64	7.62E-03	0.01	77.63	<0.01	<0.01%		
NAPHTHALENE	X	NR	—	NR	—	2.50	7.22E-03	0.01	77.63	<0.01	<0.01%		

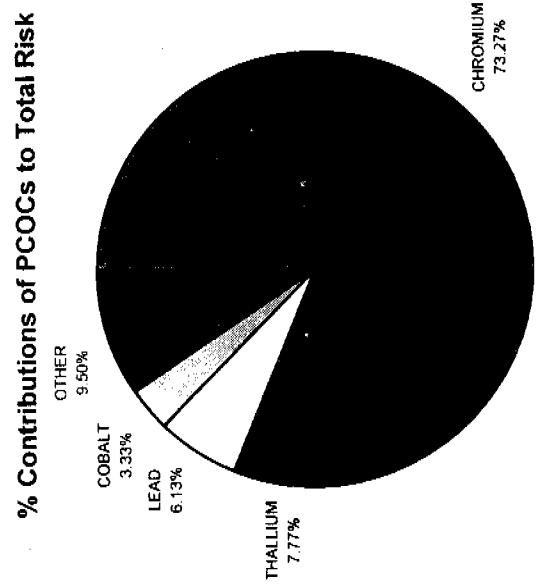
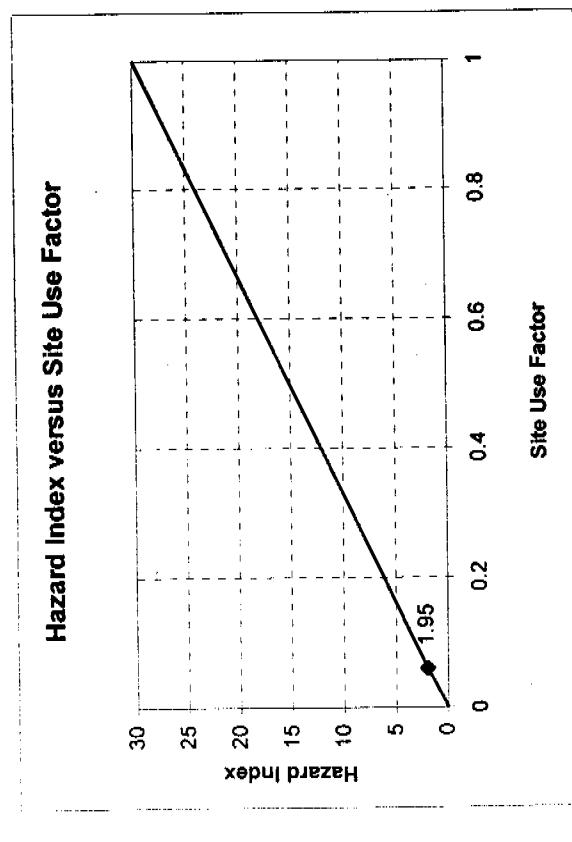
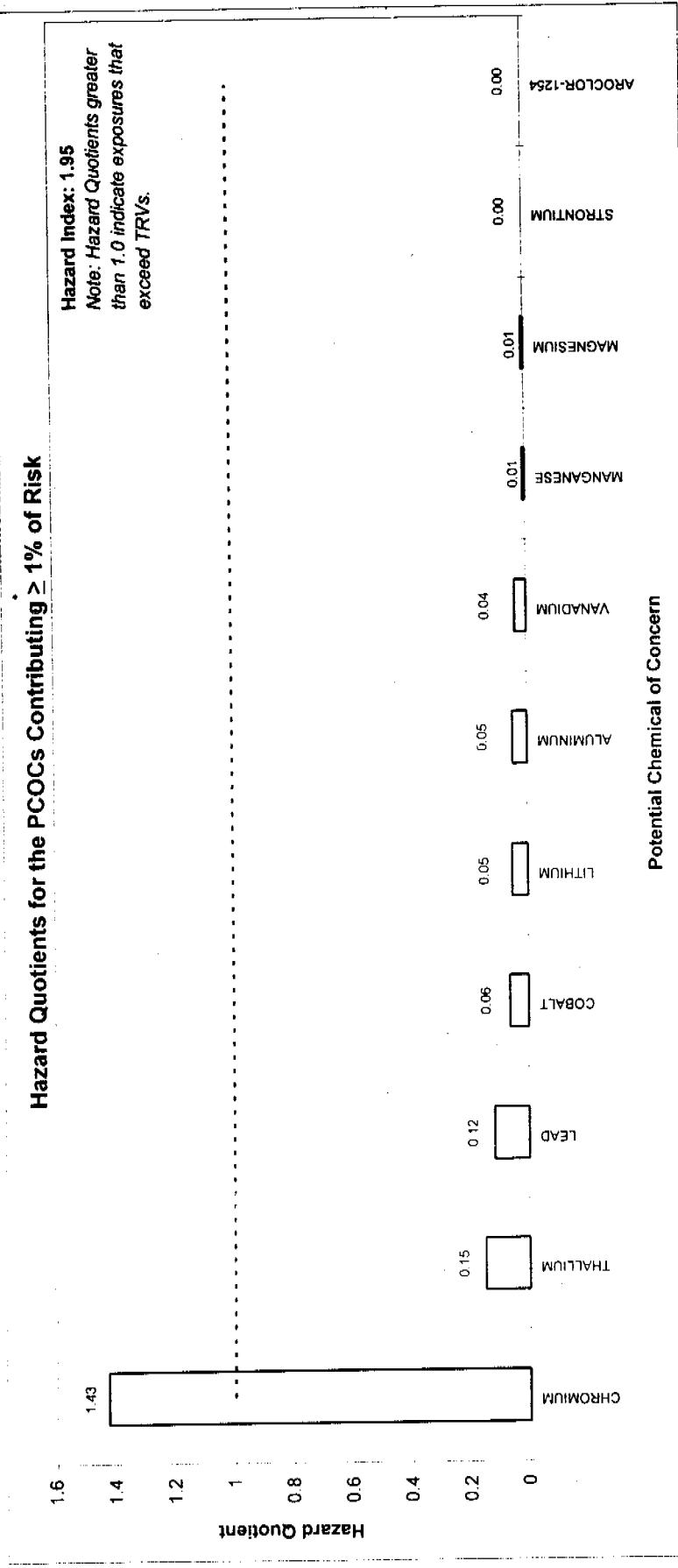
Summary of Ecotoxicological Risk to American Kestrels in the Old Landfill Source Area at RFETS

AMERICAN KESTREL OLD LANDFILL		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for QUS	UCL ₉₅	Intake	UCL ₉₅	Intake	UCI ₉₅	Intake	IR = 0.00812 SUF = 0.356			
2-METHYLNAPHTHALENE	X	NR	—	NR	—	—	0.94	2.73E-03	2.73E-03	77.63	<0.01
Di-n-OCTYL PHTHALATE	X	NR	—	NR	—	—	0.33	9.64E-04	9.64E-04	98.97	<0.01
SILVER	X	ND	—	NR	—	—	7.18	0.02	0.02	2304.90	<0.01
BUTYL BENZYL PHTHALATE	X	NR	—	NR	—	—	0.34	9.78E-04	9.78E-04	226.54	<0.01

HAZARD INDEX 4.13

¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

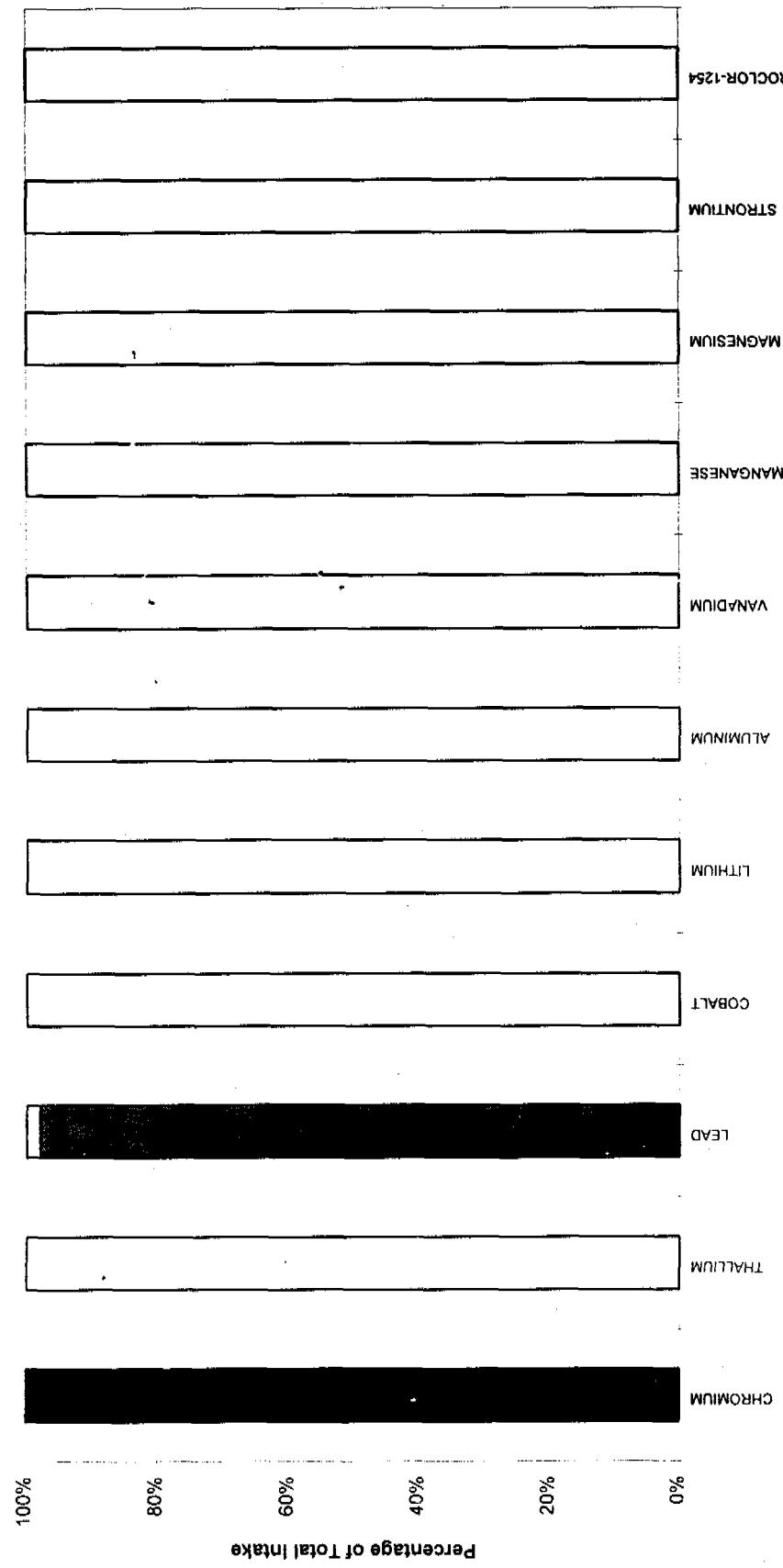
Summary of Ecotoxicological Risk to American Kestrels in the Mound Area Source Area at RFETS



Summary of Ecotoxicological Risk to American Kestrels in the Mound Area Source Area at RFETS

Contribution of Exposure Points to Total Intake

■ Small Mammal Intake ■ Terrestrial Arth. Intake □ Surficial Soil Intake



Summary of Ecotoxicological Risk to American Kestrels in the Mound Area Source Area at RFETS

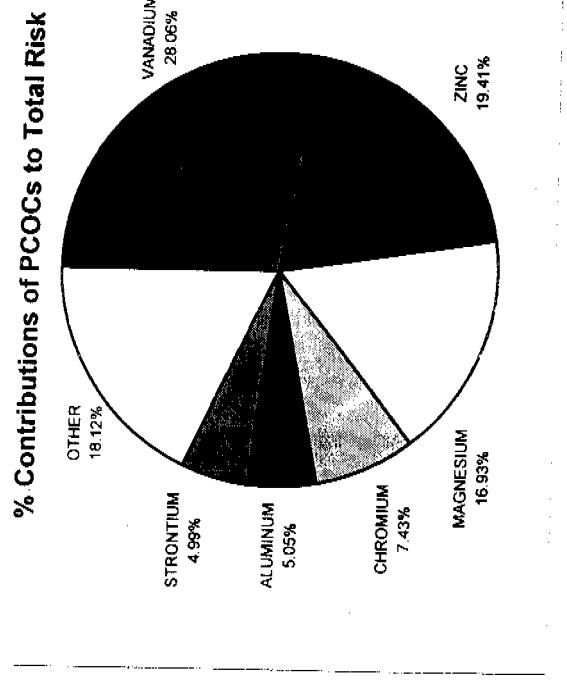
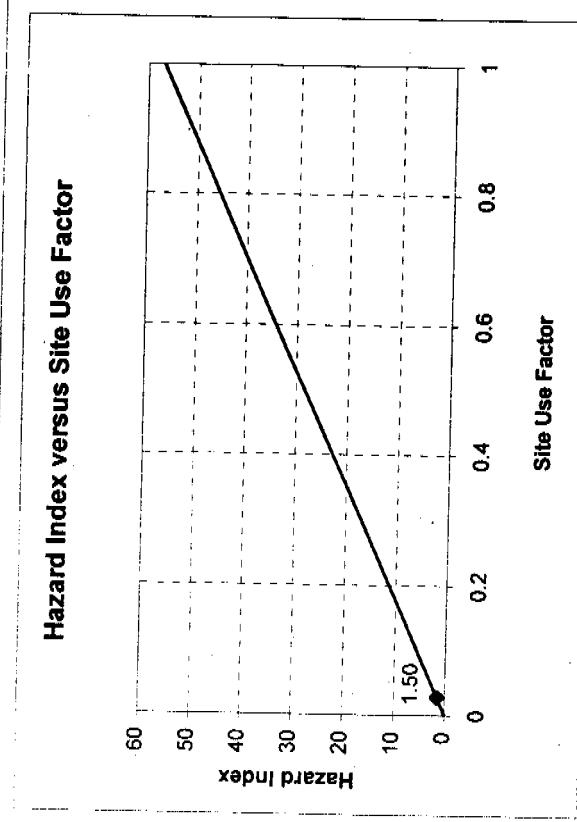
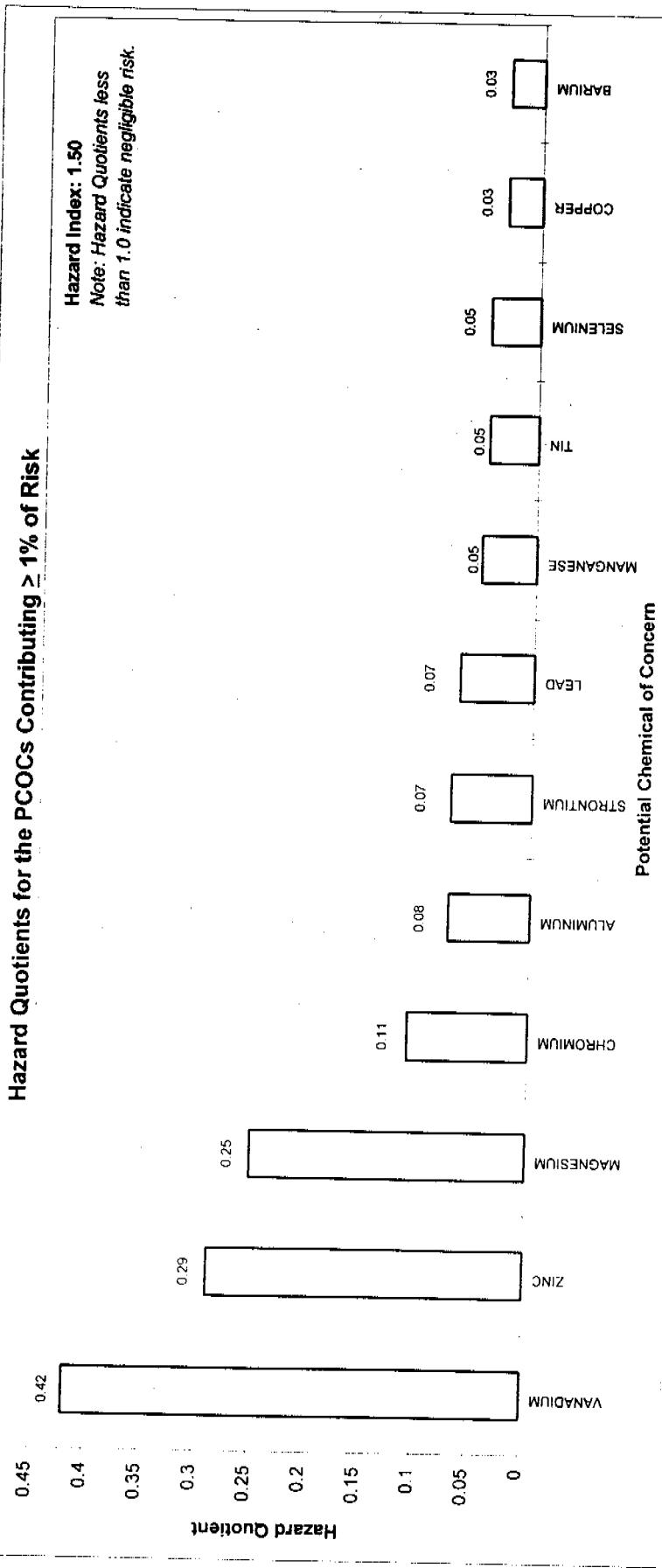
AMERICAN KESTREL MOUND AREA		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU2	UCL ₉₅	Intake	UCL ₉₅	Intake	UCI ₉₅	Intake	IR = 0.01 SUF = 0.06	IR = 0.15 SUF = 0.592	IR = 0.14 SUF = 0.14	IR = 0.14 SUF = 0.14
CHROMIUM	X	NR	—	NR	—	12.86	0.01	3.15	2.21	1.43	73.27%
THALLIUM	X	NR	—	NR	—	2.33	1.13E-03	1.13E-03	0.01	0.15	7.77%
LEAD	X	3.20	0.45	NR	—	19.45	0.01	0.46	3.85	0.12	6.13%
COBALT	X	NR	—	NR	—	10.19	4.96E-03	4.96E-03	0.08	0.06	3.33%
LITHIUM	X	NR	—	NR	—	11.19	0.01	0.01	0.10	0.05	2.79%
ALUMINUM	X	NR	—	NR	—	15228.01	7.42	7.42	147.66	0.05	2.58%
VANADIUM	X	NR	—	NR	—	50.76	0.02	0.02	0.62	0.04	2.06%
MANGANESE	X	NR	—	NR	—	338.31	0.16	0.16	21.09	0.01	0.40%
MAGNESIUM	X	NR	—	NR	—	3527.10	1.72	1.72	234.76	0.01	0.38%
STRONTIUM	X	NR	—	NR	—	129.27	0.06	0.06	14.15	<0.01	0.23%
ACROCLOR-1254	X	NR	—	NR	—	3.04	1.48E-03	1.48E-03	0.36	<0.01	0.21%
BARIUM	X	NR	—	NR	—	160.34	0.08	0.08	21.16	<0.01	0.19%
PHENANTHRENE	X	NR	—	NR	—	0.46	2.22E-04	2.22E-04	0.08	<0.01	0.15%
ARSENIC	X	NR	—	NR	—	9.35	4.56E-03	4.56E-03	1.85	<0.01	0.13%
ACROCLOR-1260	X	NR	—	NR	—	1.78	8.65E-04	8.65E-04	0.36	<0.01	0.12%
INDENO(1,2,3-cd)PYRENE	X	NR	—	NR	—	0.56	2.71E-04	2.71E-04	0.19	<0.01	0.07%
BENZO(a)PYRENE	X	NR	—	NR	—	0.17	8.30E-05	8.30E-05	0.08	<0.01	0.05%
ZINC	X	NR	—	NR	—	66.49	0.03	0.03	32.10	<0.01	0.05%
BENZO(ghi)PERYLENE	X	NR	—	NR	—	0.56	2.71E-04	2.71E-04	0.78	<0.01	0.02%
COPPER	X	NR	—	NR	—	15.23	0.01	0.01	33.68	<0.01	0.01%
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	—	NR	—	0.54	2.62E-04	2.62E-04	1.20	<0.01	0.01%
BENZO(b)FLUORANTHENE	X	NR	—	NR	—	0.34	1.65E-04	1.65E-04	0.77	<0.01	0.01%
FLUORANTHENE	X	NR	—	NR	—	0.28	1.36E-04	1.36E-04	0.78	<0.01	0.01%
PYRENE	X	NR	—	NR	—	0.21	1.01E-04	1.01E-04	-	0.78	<0.01
BENZO(a)ANTHRACENE	X	NR	—	NR	—	0.18	8.72E-05	8.72E-05	0.78	<0.01	0.01%
CHRYSENE	X	NR	—	NR	—	0.10	4.87E-05	4.87E-05	0.78	<0.01	<0.01%
NICKEL	NR	—	NR	—	11.67	0.01	0.01	146.12	<0.01	<0.01	<0.01%

HAZARD INDEX 1.95

¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

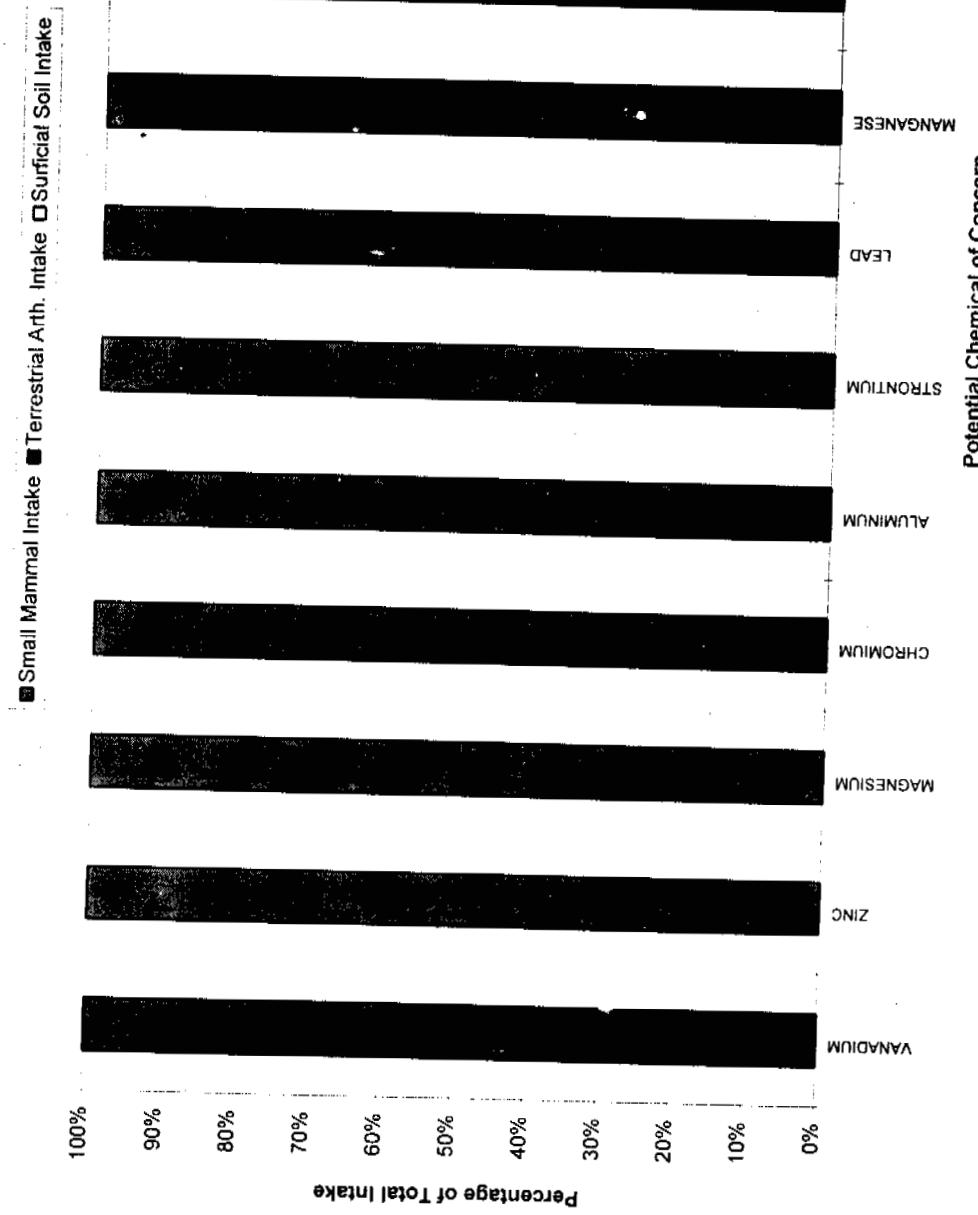
² Chromium and lead concentrations in terrestrial arthropods estimated from tissue:soil ratios in East Trenches source area.

Summary of Ecotoxicological Risk to American Kestrels in the OU6 Burial Trenches Source Area at RFETS



Summary of Ecotoxicological Risk to American Kestrels in the OU6 Burial Trenches Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to American Kestrels in the OU6 Burial Trenches Source Area at RFETS

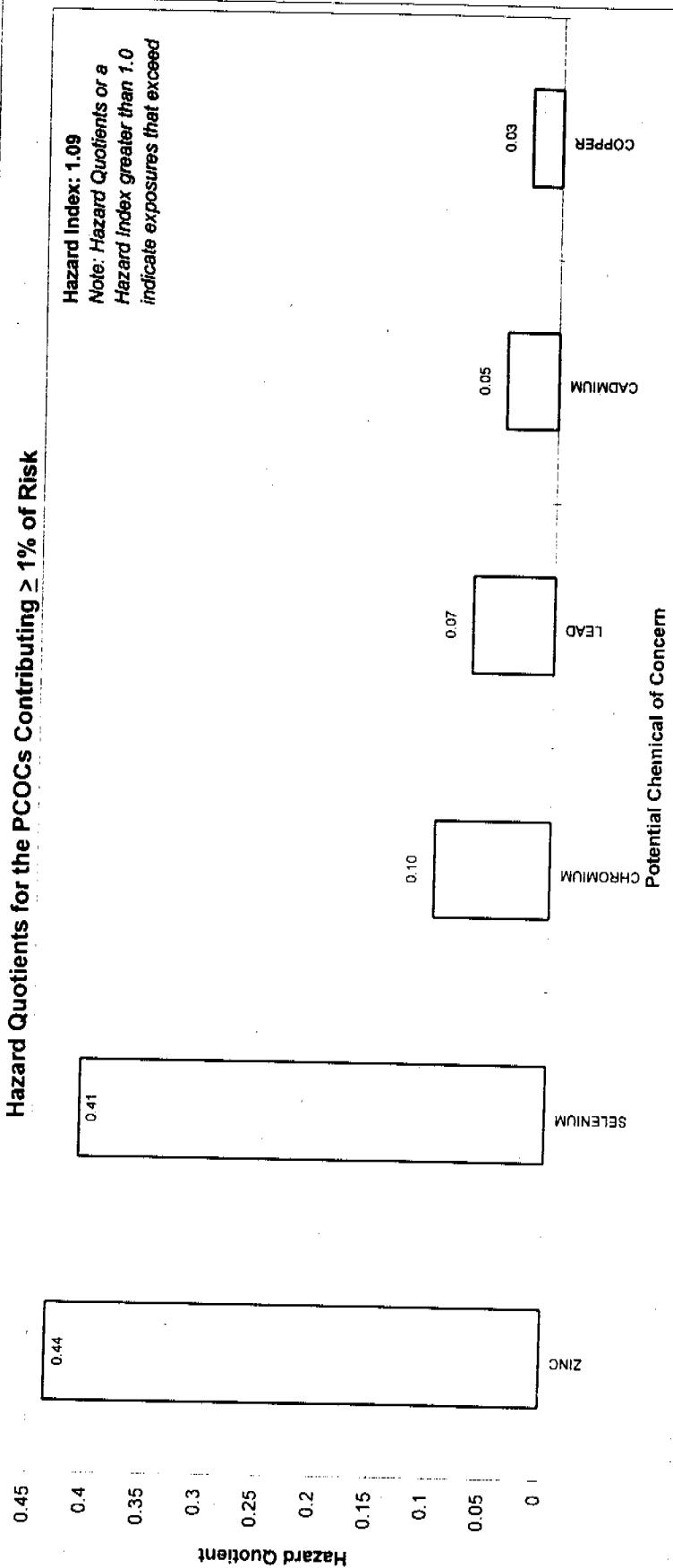
AMERICAN KESTREL OU6 BURIAL TRENCHES		EXPOSURE POINT ¹						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU6	IR = 0.29 SUF = 0.028	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00812 SUF = 0.028	—	—
VANADIUM	X	31.85	0.26	NR	—	NR	—	—	0.26	0.62	0.42
ZINC	X	1148.37	9.32	NR	—	NR	—	—	9.32	32.10	0.29
MAGNESIUM	X	7324.19	59.47	NR	—	NR	—	—	59.47	234.76	0.25
CHROMIUM	X	30.22	0.25	NR	—	NR	—	—	0.25	2.21	0.11
ALUMINUM	X	1375.78	11.17	NR	—	NR	—	—	11.17	147.66	0.08
STRONTIUM	X	130.26	1.06	NR	—	NR	—	—	1.06	14.15	0.07
LEAD	X	32.34	0.26	NR	—	NR	—	—	0.26	3.85	0.07
MANGANESE	X	131.94	1.07	NR	—	NR	—	—	1.07	21.09	0.05
TIN		130.69	1.06	NR	—	NR	—	—	1.06	23.39	0.05
SELENIUM		4.58	0.04	NR	—	NR	—	—	0.04	0.82	0.05
COPPER	X	129.61	1.05	NR	—	NR	—	—	1.05	33.68	0.03
BARIUM	X	78.93	0.64	NR	—	NR	—	—	0.64	21.16	0.03
SILVER	X	6.28	0.05	NR	—	NR	—	—	0.05	— 2304.90	0.00
											<0.01%

¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

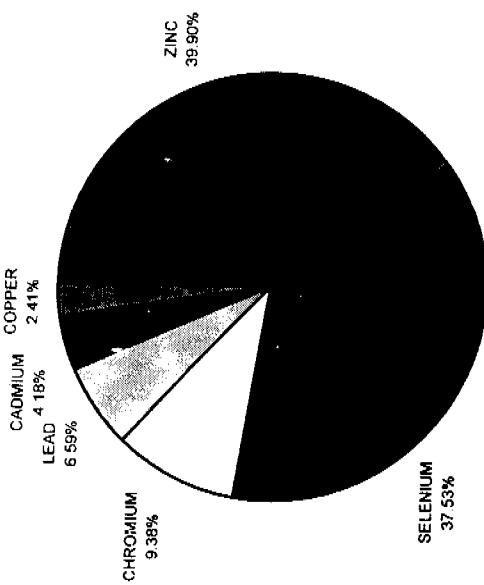
HAZARD INDEX 1.50

Summary of Ecotoxicological Risk to American Kestrels in the C-Ponds Source Area at RFETS

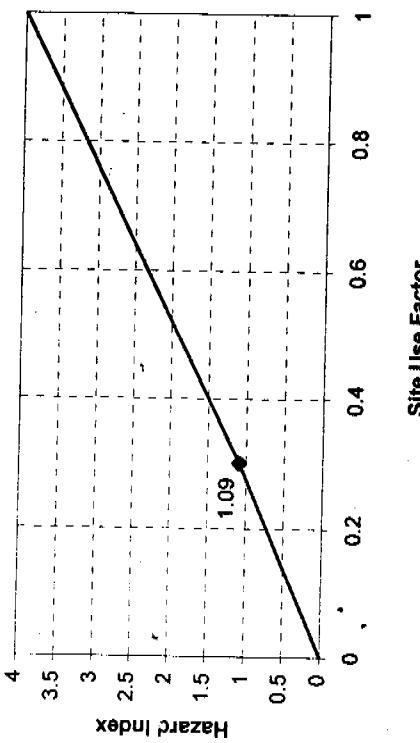
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

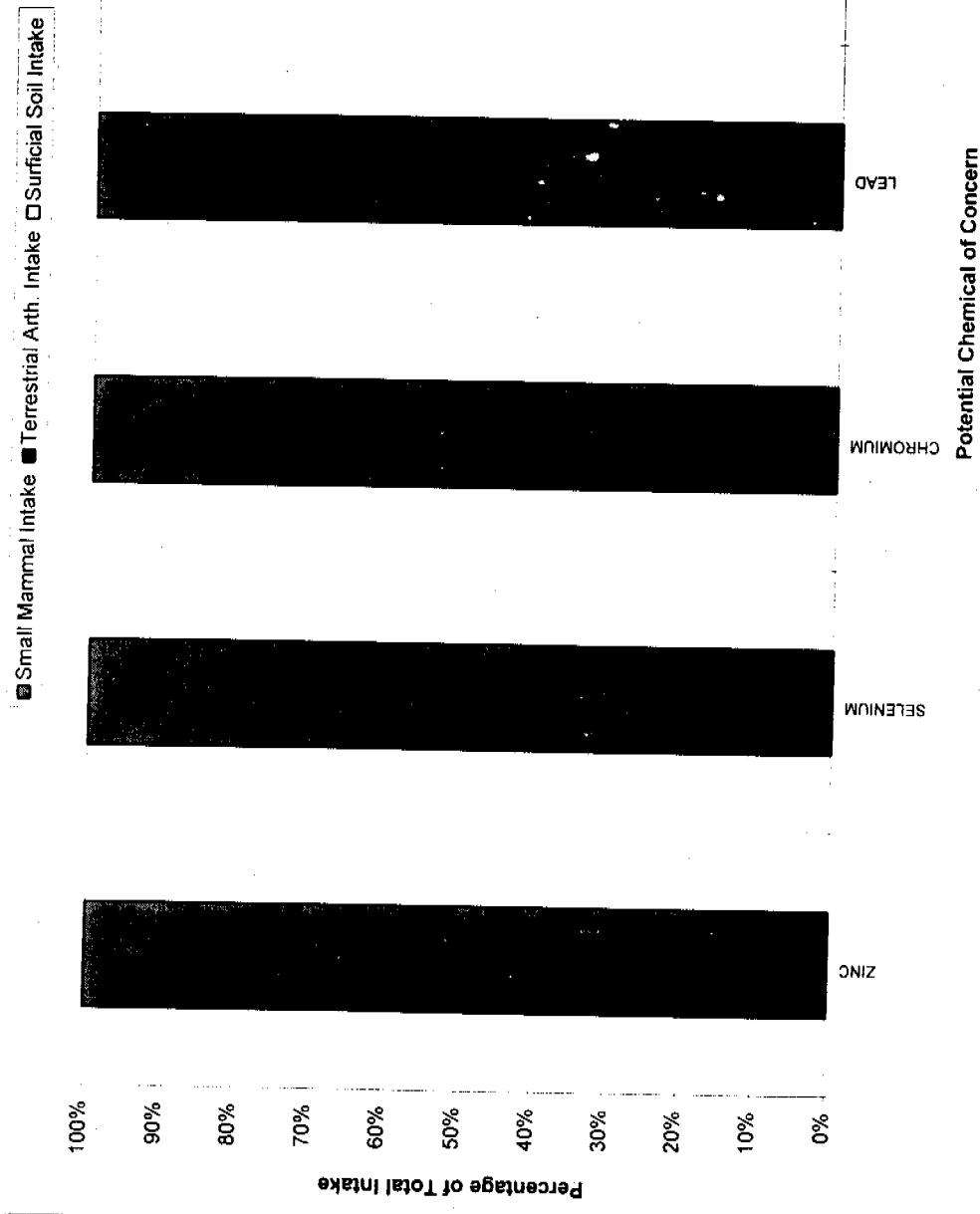


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to American Kestrels in the C-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to American Kestrels in the C-Ponds Source Area at RFETS

AMERICAN KESTREL C PONDS		EXPOSURE POINT						SUMMARY			
		Small Mammal		Terrestrial Arth.		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	PCOC for OU5	UCI ₉₅ SUF = 0.301	Intake	UCI ₉₅ SUF = 0.301	Intake	UCI ₉₅ SUF = 0.00812	Intake	UCI ₉₅ SUF = 0.301	Intake	UCI ₉₅ SUF = 0.301	
ZINC	X	331.68	13.98	NC	—	NC	—	13.98	32.10	0.44	39.90%
SELENIUM		7.96	0.34	ND	—	NC	—	0.34	—	0.82	0.41
CHROMIUM		5.36	0.23	ND	—	NC	—	0.23	2.21	0.10	9.38%
LEAD	X	6.57	0.28	NC	—	NC	—	0.28	3.85	0.07	6.59%
CADMİUM		3.37	0.14	NC	—	ND	—	0.14	3.12	0.05	4.18%
COPPER	X	21.04	0.89	NC	—	NC	—	0.89	33.68	0.03	2.41%

HAZARD INDEX 1.09

37
Summary of Ecotoxicological Risk to American Kestrels in the North Spray Field Source Area at RFETS

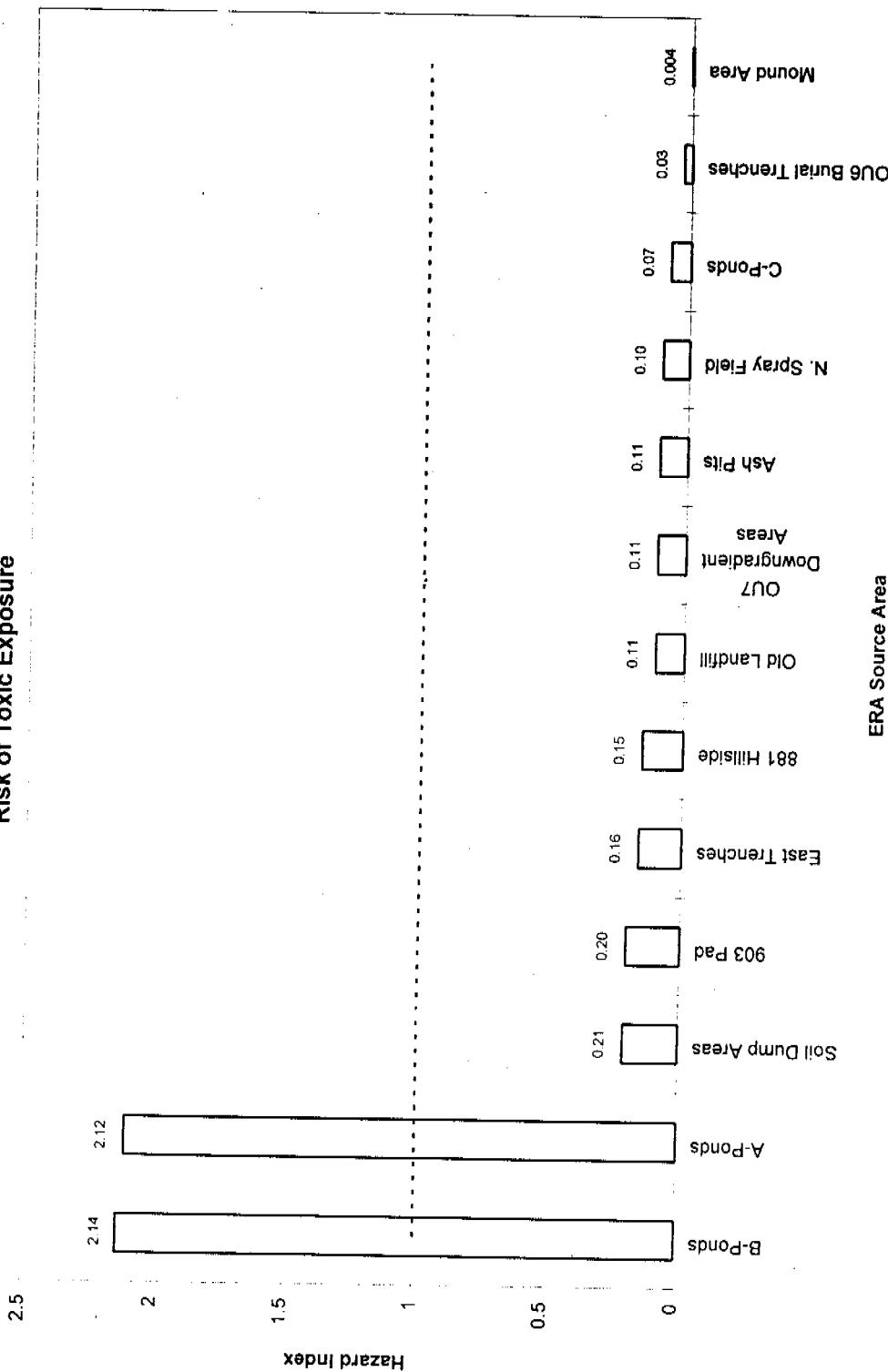
AMERICAN KESTREL NORTH SPRAY FIELD		EXPOSURE POINT ¹						SUMMARY						
Analyte	PCOC for OU6	Small Mammal			Terrestrial Arth.			Surficial Soil			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
		UCLo _{ss}	Intake	UC ₉₅	Intake	UC ₉₅	Intake	IR = 0.00812	SUF = 0.119					
COBALT	X	NR	—	NR	—	NR	—	9.70	0.01	0.01	0.08	0.12	22.94%	
THALLIUM		NR	—	NR	—	NR	—	0.93	8.97E-04	8.97E-04	0.01	0.12	22.45%	
ALUMINUM		NR	—	NR	—	NR	—	11487.90	11.10	11.10	147.66	0.08	14.11%	
LITHIUM		NR	—	NR	—	NR	—	6.56	0.01	0.01	0.10	0.06	11.87%	
VANADIUM	X	NR	—	NR	—	NR	—	33.08	0.03	0.03	0.62	0.05	9.74%	
BERYLLIUM		NR	—	NR	—	NR	—	0.63	6.12E-04	6.12E-04	0.02	0.04	7.46%	
MANGANESE	X	NR	—	NR	—	NR	—	319.60	0.31	0.31	21.09	0.01	2.75%	
LEAD	X	NR	—	NR	—	NR	—	40.40	0.04	0.04	3.85	0.01	1.90%	
MAGNESIUM	X	NR	—	NR	—	NR	—	2325.99	2.25	2.25	234.76	0.01	1.80%	
BARIUM	X	NR	—	NR	—	NR	—	169.61	0.16	0.16	21.16	0.01	1.45%	
CHROMIUM	X	NR	—	NR	—	NR	—	12.82	0.01	0.01	2.21	0.01	1.05%	
MERCURY	X	NR	—	NR	—	NR	—	0.07	6.37E-05	6.37E-05	0.01	<0.01	0.87%	
ARSENIC	X	NR	—	NR	—	NR	—	6.62	0.01	0.01	1.85	<0.01	0.65%	
STRONTIUM	X	NR	—	NR	—	NR	—	31.03	0.03	0.03	14.15	<0.01	0.40%	
ZINC	X	NR	—	NR	—	NR	—	48.93	0.05	0.05	32.10	<0.01	0.28%	
SELENIUM		NR	—	NR	—	NR	—	0.58	5.56E-04	5.56E-04	0.82	<0.01	0.13%	
COPPER	X	NR	—	NR	—	NR	—	14.01	0.01	0.01	33.68	<0.01	0.08%	
CADMIUM		NR	—	NR	—	NR	—	0.99	9.57E-04	9.57E-04	3.12	<0.01	0.08%	
NICKEL	X	NR	—	NR	—	NR	—	15.06	0.01	0.01	146.12	<0.01	0.02%	

¹ Because of insufficient terrestrial arthropod data, entire diet represented by small mammal in this source area.

HAZARD INDEX 0.53

Summary of Ecotoxicological Risk to Coyotes at RFETS

Contribution of ERA Source Areas to Coyotes Risk of Toxic Exposure



ERA Source Area

Summary of Ecotoxicological Risk to Coyotes in the B-Ponds Source Area at RFETS

COYOTE B-PONDS	EXPOSURE POINT										SUMMARY					
	Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake		Toxicity Reference Value	Hazard Quotient	Percent of Total Risk			
	UCL ₉₅ IR = 0.042 FI = 0.006	Intake UCL ₉₅ IR = 0.005 FI = 0.006	UCL ₉₅ IR = 0.005 FI = 0.006	Estimated Value	Intake UCL ₉₅ IR = 0.00132 FI = 0.006	UCL ₉₅ IR = 0.077 FI = 0.169	Intake UCL ₉₅ IR = 0.077 FI = 0.169	—	ND	—	0.01	1.11E-04	0.02	1.81		
Antimony	121.20	0.03	ND	—	IR = 0.00132 FI = 0.006	IR = 0.077 FI = 0.169	—	ND	—	0.01	1.11E-04	0.03	0.02	84.31%		
Chromium	32.11	0.01	5.29	1.59E-04	1.17E-04 IR = 0.00132 FI = 0.006	1.59E-04 IR = 0.077 FI = 0.169	—	NR	—	0.01	2.02E-03	2.63E-05	0.01	0.11	5.21%	
Lead	78.53	0.02	1.27	0.05	8678.88	0.07	15.50	0.20	0.20	0.01	0.13	0.07	0.07	3.12%		
Manganese	606.87	0.15	116.03	3.48E-03	55.00	4.36E-04	0.01	6.67E-05	0.01	0.02	6.67E-05	0.02	1.47	0.04	1.91%	
Nickel	84.59	0.02	53.95	3.48E-03	112.99	8.95E-04	0.03	3.39E-04	0.03	0.03	3.39E-04	0.16	48.70	<0.01	0.32%	
Potassium	163.89	0.04	66.45	7.65E-04	13.25	1.05E-04	1.58E-03	2.06E-05	0.10	0.03	1.28E-03	0.03	26.78	<0.01	0.27%	
Silver	16.47	4.15E-03	5.01	1.50E-04	ND	—	3.05	2.41E-05	ND	—	2.41E-05	0.03	0.03	<0.01	0.24%	
Thallium	ND	—	2.03	6.10E-05	ND	—	ND	—	ND	—	4.30E-03	6.71	<0.01	0.19%		
Zinc	ND	—	26.51	7.65E-04	1.99E-03	509.65	4.04E-03	0.26	0.26	0.05	8.26E-05	0.03	7.55	<0.01	0.15%	
Acetone	NR	—	NR	—	NR	—	NR	—	NR	—	9.86E-04	1.28E-05	7.35E-05	0.12	<0.01	0.03%
Tetrachloroethene	NR	—	NR	—	NR	—	NR	—	NR	—	1.58E-03	2.33E-06	5.43E-05	0.20	<0.01	0.01%
1,2-Dichloroethene	NR	—	NR	—	NR	—	NR	—	NR	—	3.66E-03	4.76E-05	4.76E-05	1.87	<0.01	<0.01%
Chloroform	NR	—	NR	—	NR	—	NR	—	NR	—	2.55E-03	3.29E-05	3.29E-05	2.27	<0.01	<0.01%
Aroclor-1254	NR	—	NR	—	NR	—	NR	—	NR	—	1.38E-04	2.21E-03	2.88E-05	12.17	<0.01	<0.01%
1,2-Dichloroethane	NR	—	0.01	3.10E-07	ND	—	NR	—	NR	—	2.26E-03	2.94E-05	2.94E-05	3.04	<0.01	<0.01%
Trichloroethene	NR	—	NR	—	NR	—	NR	—	NR	—	3.10E-07	—	3.10E-07	0.06	<0.01	<0.01%
Di-n-Butyl Phthalate	NR	—	NR	—	NR	—	NR	—	NR	—	2.54E-03	3.31E-05	3.31E-05	7.12	<0.01	<0.01%
Di-n-Butyl Phthalate	NR	—	NR	—	NR	—	NR	—	NR	—	2.88E-03	3.74E-05	3.74E-05	19.58	<0.01	<0.01%
Di-n-Butyl Phthalate	NR	—	NR	—	NR	—	NR	—	NR	—	4.98E-03	6.48E-05	6.48E-05	74.41	<0.01	<0.01%

HAZARD INDEX 2.14

Summary of Ecotoxicological Risk to Coyotes in the A-Ponds Source Area at RFETS

COYOTE A_PONDS	EXPOSURE POINT										SUMMARY					
	Small Mammal			Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Intake	UCL ₉₅ IR = 0.005 FI = 0.008	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	IR = 0.00132 FI = 0.008	UCL ₉₅	Intake	UCL ₉₅ IR = 0.077 FI = 0.277	—	—	—	—	
ANTIMONY	IR = 0.042 FI = 0.008	95.78	0.03	ND	—	ND	—	0.01	1.89E-04	0.03	0.02	1.91	90.17%			
VANADIUM	IR = 0.042 FI = 0.008	26.71	0.01	21.79	8.71E-04	NC	—	2.30E-03	4.90E-05	0.01	0.13	0.08	3.68%			
MAGNESIUM	5030.43	1.69	2252.60	0.09	NC	—	18.85	0.40	2.18	44.17	0.05	0.05	2.34%			
BARIUM	57.80	0.02	40.57	1.62E-03	NC	—	0.06	1.32E-03	0.02	1.65	0.01	0.01	0.64%			
ALUMINUM	925.17	0.31	238.69	0.01	NC	—	0.41	0.01	0.33	25.01	0.01	0.01	0.62%			
LEAD	80.28	0.03	1.11	4.43E-05	NC	—	3.32E-03	7.08E-05	0.03	2.43	0.01	0.01	0.53%			
MOLYBDENUM	ND	—	95.43	3.82E-03	NC	—	3.08E-03	6.56E-05	3.88E-03	0.50	0.01	0.01	0.36%			
ARSENIC	ND	—	4.42	1.77E-04	NC	—	3.55E-03	7.58E-05	2.53E-04	0.03	0.01	0.01	0.35%			
COPPER	106.49	0.04	24.12	9.65E-04	NC	—	2.10E-03	4.48E-05	0.04	5.04	0.01	0.01	0.34%			
TIN	107.61	0.04	5.80	2.32E-04	NC	—	ND	—	0.04	7.55	<0.01	<0.01	0.23%			
ZINC	646.55	0.22	57.29	2.29E-03	NC	—	0.01	1.75E-04	0.22	48.70	<0.01	<0.01	0.21%			
MERCURY	ND	—	0.10	3.94E-06	ND	—	1.49E-04	3.18E-06	7.12E-06	0.00	<0.01	<0.01	0.16%			
NICKEL	54.10	0.02	18.03	7.21E-04	NC	—	2.78E-03	5.93E-05	0.02	12.17	<0.01	<0.01	0.07%			
SELENIUM	ND	—	2.52	1.01E-04	ND	—	3.28E-03	7.00E-05	1.71E-04	0.12	<0.01	<0.01	0.07%			
MANGANESE	77.29	0.03	42.44	1.70E-03	NC	—	0.18	3.82E-03	0.03	26.78	<0.01	<0.01	0.06%			
CADMUM	ND	—	2.44	9.75E-05	NC	—	9.62E-04	2.05E-05	1.18E-04	0.12	<0.01	<0.01	0.05%			
LITHIUM	ND	—	37.90	1.52E-03	NC	—	0.03	6.52E-04	2.17E-03	2.86	<0.01	<0.01	0.04%			
SILVER	14.72	4.95E-03	ND	—	ND	—	1.86E-03	3.97E-05	4.99E-03	6.71	<0.01	<0.01	0.04%			
COBALT	ND	—	25.99	1.04E-03	NC	—	1.46E-03	3.11E-05	1.07E-03	1.51	<0.01	<0.01	0.03%			
STRONTIUM	85.89	0.03	112.50	4.50E-03	NC	—	0.28	0.01	0.04	80.04	<0.01	<0.01	0.02%			
METHYLENE CHLORIDE	NR	—	NR	—	NR	—	2.94E-03	6.26E-05	6.26E-05	1.78	<0.01	<0.01	<0.01%			
CHROMIUM	35.03	0.01	ND	—	NC	—	1.63E-03	3.48E-05	0.01	833.00	<0.01	<0.01	<0.01%			
Di-n-BUTYL PHTHALATE	NR	—	NR	ND	—	ND	4.83E-03	1.03E-04	1.03E-04	74.41	<0.01	<0.01	<0.01%			

HAZARD INDEX 2.12

Summary of Ecotoxicological Risk to Coyotes in the Soil Dump Areas Source Area at RFETS

COYOTE SOIL DUMP AREAS Analyte	EXPOSURE POINT										SUMMARY				
	Small Mammal		Vegetation			Surficial Soil			Surface Water		Total		Toxicity	Hazard	Percent of Total Risk
	UCI ₉₅ IR = 0.042 FI = 0.016	Intake IR = 0.005 FI = 0.016	UCI ₉₅ IR = 0.005 FI = 0.016	Estimated Value	Intake IR = 0.00132 FI = 0.016	UCI ₉₅ IR = 0.00132 FI = 0.016	Intake UCI ₉₅ IR = 1 FI = 1	UCI ₉₅ IR = 1 FI = 1	Intake UCI ₉₅ IR = 1 FI = 1	Intake UCI ₉₅ IR = 1 FI = 1	Reference Value	Quotient			
MERCURY	0.30	2.03E-04	0.10		8.05E-06	0.08	1.64E-06	NR	—	2.13E-04	2.12E-03	0.10	47.53%		
MAGNESIUM	1292.00	0.87	1537.93	0.12	2356.56	0.05	NR	—	1.04	44.17	0.02	11.18%			
VANADIUM	ND	—	26.61	2.13E-03	25.69	5.43E-04	NR	—	2.67E-03	0.13	0.02	9.98%			
ALUMINUM	451.74	0.30	142.00	0.01	8368.17	0.18	NR	—	0.49	25.01	0.02	9.32%			
BERYLLIUM	2.70	1.82E-03	ND	—	0.70	1.49E-05	NR	—	1.83E-03	0.20	0.01	4.33%			
BARIUM	11.86	0.01	21.08	1.69E-03	135.77	2.37E-03	NR	—	0.01	1.65	0.01	3.59%			
TIN	77.10	0.05	38.48	3.08E-03	ND	—	NR	—	0.05	7.55	0.01	3.45%			
MOLYBDENUM	ND	—	38.99	3.12E-03	ND	—	NR	—	3.12E-03	0.50	0.01	2.93%			
SELENIUM	ND	—	6.62	5.30E-04	ND	—	NR	—	5.30E-04	0.12	<0.01	2.05%			
ARSENIC	ND	—	ND	—	4.82	1.02E-04	NR	—	1.02E-04	0.03	<0.01	1.42%			
CADMIUM	ND	—	2.47	1.98E-04	3.05	6.45E-05	NR	—	2.62E-04	0.12	<0.01	1.03%			
COPPER	9.48	0.01	8.06	6.45E-04	17.78	3.76E-04	NR	—	0.01	5.04	<0.01	0.70%			
ZINC	85.71	0.06	32.11	2.57E-03	57.21	1.21E-03	NR	—	0.06	48.70	<0.01	0.60%			
LITHIUM	ND	—	32.04	2.56E-03	7.90	1.67E-04	NR	—	2.73E-03	2.86	<0.01	0.45%			
LEAD	2.51	1.68E-03	1.22	9.79E-05	25.35	5.35E-04	NR	—	2.32E-03	2.43	<0.01	0.45%			
MANGANESE	15.08	0.01	48.49	3.88E-03	256.10	0.01	NR	—	0.02	26.78	<0.01	0.34%			
THALLIUM	ND	—	ND	—	0.89	1.89E-05	NR	—	1.89E-05	0.03	<0.01	0.34%			
STRONTIUM	33.63	0.02	80.64	0.01	38.68	8.17E-04	NR	—	0.03	80.04	<0.01	0.18%			
NICKEL	ND	—	20.48	1.64E-03	10.77	2.28E-04	NR	—	1.87E-03	12.17	<0.01	0.07%			
COBALT	ND	—	ND	—	6.83	1.44E-04	NR	—	1.44E-04	1.51	<0.01	0.05%			
AROCLOR-1254	NR	—	NR	7.36E-04	6.00E-08	0.10	2.20E-06	NR	—	2.26E-06	0.06	<0.01	0.02%		
CHROMIUM	ND	—	ND	—	12.07	2.55E-04	NR	—	2.55E-04	833.00	<0.01	<0.01			

HAZARD INDEX **0.21**

Summary of Ecotoxicological Risk to Coyotes in the 903 Pad Source Area at RFETS

COYOTE 903 PAD	Analyte	EXPOSURE POINT										SUMMARY				
		Small Mammal		Vegetation			Surficial Soil			Surface Water		Toxicity		Hazard	Percent of Total Risk	
		IR = 0.042	FI = 0.025	IR = 0.005	FI = 0.025	IR = 0.025	FI = 0.025	IR = 0.025	FI = 0.066	IR = 0.00132	IR = 0.0077	Intake	Reference Value	Quotient	Total Risk	
ANTIMONY	NR	—	ND	—	ND	—	12.20	4.03E-04	0.02	1.00E-04	5.03E-04	0.017	0.03	14.47%		
SELENIUM	3.11	3.27E-03	2.29	—	2.86E-04	0.68	2.24E-05	0.01	4.13E-05	3.62E-03	0.123	0.03	14.38%			
VANADIUM	NR	—	17.31	—	2.16E-03	35.68	1.18E-03	0.03	1.34E-04	3.47E-03	0.127	0.03	13.35%			
CADMIUM	2.63	2.76E-03	2.11	—	2.64E-04	1.29	4.26E-05	2.30E-03	1.17E-05	3.08E-03	0.120	0.03	12.50%			
MOLYBENUM	NR	—	87.52	—	0.01	4.98	1.64E-04	0.02	1.23E-04	0.01	0.505	0.02	10.86%			
ALUMINUM	NR	—	297.17	—	0.04	11.88E-18	0.39	5.48	0.03	0.46	25.013	0.02	8.92%			
MAGNESIUM	NR	—	1426.04	—	0.18	3426.35	0.11	39.93	0.20	0.49	44.166	0.01	5.46%			
BARIUM	NR	—	59.79	—	0.01	143.68	4.74E-03	0.26	1.33E-03	0.01	1.654	0.01	3.99%			
MERCURY	ND	—	0.10	—	1.22E-05	0.08	2.51E-06	1.14E-04	5.80E-07	1.53E-05	0.002	0.01	3.53%			
ARSENIC	NR	—	ND	—	—	4.00	1.32E-04	0.01	2.82E-05	1.60E-04	0.034	<0.01	2.29%			
COPPER	16.63	0.02	10.42	—	1.30E-03	21.82	7.20E-04	0.02	1.22E-04	0.02	5.041	<0.01	1.90%			
ZINC	154.35	0.16	29.15	—	3.64E-03	72.70	2.40E-03	0.23	1.16E-03	0.17	48.696	<0.01	1.70%			
LEAD	5.39	0.01	1.79	—	2.24E-04	32.37	1.07E-03	0.01	3.38E-05	0.01	2.435	<0.01	1.40%			
LITHIUM	NR	—	49.67	—	0.01	13.59	4.49E-04	0.07	3.59E-04	0.01	2.856	<0.01	1.20%			
COBALT	NR	—	25.37	—	3.17E-03	7.67	2.53E-04	0.01	6.05E-05	3.49E-03	1.510	<0.01	1.13%			
TIN	NR	—	64.48	—	0.01	33.32	1.10E-03	0.05	2.68E-04	0.01	7.551	<0.01	0.61%			
MANGANESE	NR	—	170.00	—	0.02	318.24	0.01	0.31	1.58E-03	0.03	26.783	<0.01	0.61%			
THALLIUM	NR	—	ND	—	—	0.87	2.86E-05	ND	—	2.86E-05	0.026	<0.01	0.53%			
NITRATE/NITRITE	NR	—	NR	—	—	3.11	1.02E-04	0.79	4.03E-03	4.13E-03	3.969	<0.01	0.51%			
ACROCLOR-1254	NR	—	NR	1.47E-03	1.80E-07	0.21	6.88E-06	1.88E-03	9.54E-06	1.66E-05	0.059	<0.01	0.14%			
BERYLLIUM	NR	—	ND	—	—	1.29	4.25E-05	1.26E-03	6.40E-06	4.89E-05	0.201	<0.01	0.12%			
NICKEL	NR	—	12.60	—	1.58E-03	26.99	8.91E-04	0.01	7.20E-05	2.54E-03	12.174	<0.01	0.10%			
STRONTIUM	NR	—	46.85	—	0.01	43.04	1.42E-03	1.03	0.01	0.01	80.043	<0.01	0.08%			
ACROCLOR-1248	NR	—	NR	2.41E-03	3.00E-07	0.21	6.97E-06	ND	—	7.27E-06	0.060	<0.01	0.06%			
SILVER	ND	—	5.59	—	6.99E-04	ND	—	4.50E-03	2.29E-05	7.22E-04	6.711	<0.01	0.05%			
BENZO(a)PYRENE	NR	—	NR	4.23E-03	5.30E-07	0.32	1.06E-05	ND	—	1.11E-05	0.135	<0.01	0.04%			
DIBENZO(a,h)ANTHRACENE	NR	—	NR	1.46E-03	1.80E-07	0.18	5.91E-06	ND	—	6.09E-06	0.135	<0.01	0.02%			
1,2-DICHLOROETHENE	NR	—	NR	NR	—	NR	—	0.01	5.82E-05	5.82E-05	2.266	<0.01	0.01%			
ACETONE	NR	—	NR	NR	—	NR	—	0.01	6.67E-05	6.67E-05	3.043	<0.01	0.01%			
TETRACHLOROETHENE	NR	—	NR	NR	—	NR	—	0.01	3.20E-05	3.20E-05	1.866	<0.01	0.01%			
CHLORFORM	NR	—	NR	NR	—	NR	—	0.01	5.47E-05	5.47E-05	4.565	<0.01	0.01%			
METHYLENE CHLORIDE	NR	—	NR	NR	—	NR	—	0.01	3.71E-03	1.89E-05	1.780	<0.01	0.01%			
BENZYL ALCOHOL	NR	—	NR	ND	—	ND	—	0.01	2.71E-05	2.71E-05	3.126	<0.01	<0.01%			
BENZO(a)ANTHRACENE	NR	—	NR	0.01	6.30E-07	0.33	1.10E-05	ND	—	1.17E-05	1.350	<0.01	<0.01%			
BENZO(b)FLUORANTHENE	NR	—	NR	2.08E-03	2.60E-07	0.34	1.11E-05	ND	—	1.14E-05	1.350	<0.01	<0.01%			
CHROMIUM	5.03	0.01	5.51	—	6.89E-04	26.79	8.84E-04	0.01	5.77E-05	0.01	832.996	<0.01	<0.01%			
BENZO(k)FLUORANTHENE	NR	—	NR	1.32E-03	1.70E-07	0.31	1.03E-05	ND	—	1.04E-05	1.350	<0.01	<0.01%			
INDENO(1,2,3-cd)PYRENE	NR	—	NR	2.58E-04	3.00E-08	0.19	6.20E-06	ND	—	6.23E-06	1.350	<0.01	<0.01%			
CARBON DISULFIDE	NR	—	NR	NR	—	NR	—	2.84E-03	1.44E-05	1.44E-05	1.44E-05	<0.01	<0.01%			
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	0.02	2.47E-06	0.25	8.20E-06	ND	—	1.07E-05	3.322	<0.01	<0.01%			
TRICHLOROETHENE	NR	—	NR	NR	—	NR	—	0.01	6.22E-05	6.22E-05	2.480	<0.01	<0.01%			
PYRENE	NR	—	NR	0.03	3.56E-06	0.64	2.12E-05	ND	—	2.48E-05	9.996	<0.01	<0.01%			
FLUORANTHENE	NR	—	NR	0.03	3.21E-06	0.69	2.27E-05	ND	—	2.60E-05	16.659	<0.01	<0.01%			

Summary of Ecotoxicological Risk to Coyotes in the 903 Pad Source Area at RFETS

COYOTE 903 PAD	EXPOSURE POINT										SUMMARY			
	Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
Analyte	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00132	FI = 0.025	IR = 0.077	FI = 0.066	
CHRYSENE	NR	—	NR	0.01	9.40E-07	0.34	1.12E-05	ND	—	—	—	—	—	
Di-n-BUTYL PHTHALATE	NR	—	NR	0.03	3.90E-06	0.35	1.17E-05	0.01	3.06E-05	4.61E-05	1.22E-05	13.503	<0.01	
FLUORENE	NR	—	NR	0.03	3.52E-06	0.19	6.26E-06	ND	—	—	74.412	<0.01	<0.01%	
BENZO(g,h)PERYLENE	NR	—	NR	5.83E-04	7.00E-08	0.19	6.31E-06	ND	—	—	16.659	<0.01	<0.01%	
ACENAPHTHENE	NR	—	NR	0.03	3.70E-06	0.19	6.14E-06	ND	—	—	13.503	<0.01	<0.01%	
PHENANTHRENE	NR	—	NR	0.05	6.56E-06	0.56	1.83E-05	ND	—	9.84E-06	23.323	<0.01	<0.01%	
ANTHRACENE	NR	—	NR	0.02	2.60E-06	0.20	6.62E-06	ND	—	2.49E-05	135.026	<0.01	<0.01%	
										IR = 0.077	FI = 0.066	133.274	<0.01	

HAZARD INDEX 0.20

Summary of Ecotoxicological Risk to Coyotes in the East Trenches Source Area at RFETS

COYOTE EAST TRENCHES	EXPOSURE POINT										SUMMARY				
	Small Mammal		Vegetation		Surficial Soil		Surface Water		Total		Toxicity	Hazard	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I	Reference Value	Quotient	Total Risk		
Analyte	IR = 0.042 FI = 0.036	IR = 0.005 FI = 0.036	IR = 0.00132 FI = 0.036	—	0.73	3.49E-05 NR	—	0.01	0.12	0.06					
SELENIUM	4.61	0.01	ND	—	—	—	—	0.00	0.12	0.04					
CADMIUM	2.55	3.85E-03	2.22	3.99E-04	1.44	6.83E-05 NR	—	—	—	—					
ALUMINUM	NR	—	NR	—	12216.91	0.58	NR	—	0.58	25.01	0.02				
VANADIUM	NR	—	NR	—	—	27.79	1.32E-03 NR	—	0.00	0.13	0.01				
ZINC	308.38	0.47	33.84	0.01	54.00	2.57E-03 NR	—	—	0.47	48.70	0.01				
ARSENIC	NR	—	NR	—	5.50	2.61E-04 NR	—	—	0.00	0.03	0.01				
LEAD	8.59	0.01	1.51	2.72E-04	45.99	2.19E-03 NR	—	—	0.02	2.43	0.01				
COPPER	17.17	0.03	10.43	1.88E-03	13.08	6.22E-04 NR	—	—	0.03	5.04	0.01				
BARIUM	NR	—	NR	—	128.84	0.01 NR	—	—	0.01	1.65	<0.01				
MAGNESIUM	NR	—	NR	—	2431.74	0.12 NR	—	—	0.12	44.17	<0.01				
MANGANESE	NR	—	NR	—	310.49	0.01 NR	—	—	0.01	26.78	<0.01				
BERYLLIUM	NR	—	NR	—	1.56	7.40E-05 NR	—	—	0.00	0.20	<0.01				
COBALT	NR	—	NR	—	7.14	3.39E-04 NR	—	—	0.00	1.51	<0.01				
LITHIUM	NR	—	NR	—	13.27	6.30E-04 NR	—	—	0.00	2.86	<0.01				
TIN	NR	—	NR	—	34.19	1.62E-03 NR	—	—	0.00	7.55	<0.01				
SILVER	ND	—	5.10	9.19E-04	3.59	1.70E-04 NR	—	—	0.00	6.71	<0.01				
BENZO(a)PYRENE	NR	—	NR	2.76E-03	5.00E-07	0.21	9.96E-06 NR	—	0.00	0.14	<0.01				
NICKEL	NR	—	NR	—	11.63	5.53E-04 NR	—	—	0.00	12.17	<0.01				
STRONTIUM	NR	—	NR	—	34.85	1.66E-03 NR	—	—	0.00	80.04	<0.01				
BENZO(a)ANTHRACENE	NR	—	NR	3.18E-03	5.70E-07	0.21	1.01E-05 NR	—	0.00	1.35	<0.01				
BENZO(b)FLUORANTHENE	NR	—	NR	1.23E-03	2.20E-07	0.20	9.44E-06 NR	—	0.00	—					
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	0.02	3.16E-06	0.22	1.05E-05 NR	—	0.00	—					
CHROMIUM	ND	—	7.23	1.30E-03	12.98	6.17E-04 NR	—	—	0.00	2.48	<0.01				
PYRENE	NR	—	NR	0.01	1.74E-06	0.22	1.04E-05 NR	—	0.00	833.00	<0.01				
FLUORANTHENIE	NR	—	NR	0.01	1.53E-06	0.23	1.09E-05 NR	—	0.00	10.00	<0.01				
CHRYSENE	NR	—	NR	4.22E-03	7.60E-07	0.19	9.06E-06 NR	—	0.00	16.66	<0.01				
PHENANTHRENE	NR	—	NR	0.02	3.54E-06	0.21	9.90E-06 NR	—	0.00	13.50	<0.01				
										135.03	<0.01				

HAZARD INDEX 0.16

Summary of Ecotoxicological Risk to Coyotes in the 881 Hillside Source Area at RFETS

COYOTE 881 HILL SIDE		EXPOSURE POINT										SUMMARY				
		Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk			
Analyte		UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00132	IR = 0.077	IR = 0.13			
CADMIUM		IR = 0.042	UCL ₉₅ FI = 0.02	IR = 0.005	UCL ₉₅ FI = 0.02	0.61	1.41E-04	0.61	1.61E-05	1.61E-03	1.61E-05	0.01	0.12	0.04	28.60%	
SELENIUM		4.3E-03	3.65E-03	2.51	—	0.51	1.35E-04	1.95E-03	1.96E-05	3.94E-03	0.12	0.03	20.76%			
ALUMINUM		NR	—	NR	—	—	1430E-32	0.38	0.93	0.01	0.39	25.01	0.02	10.01%		
COPPER		81.05	0.07	9.56	9.56E-04	36.48	9.37E-04	0.01	9.38E-05	0.07	5.04	0.01	9.00%			
VANADIUM		NR	—	NR	—	—	41.86	1.11E-03	0.01	8.83E-05	1.19E-03	0.13	0.01	6.08%		
ANTIMONY		NR	—	NR	—	—	ND	—	0.02	1.53E-04	1.53E-04	0.02	0.01	5.85%		
NITRATENITRITE		NR	—	NR	—	—	2.11	5.57E-05	2.62	0.03	0.03	3.97	0.01	4.29%		
MAGNESIUM		NR	—	NR	—	—	3418.57	0.09	13.58	0.14	0.23	44.17	0.01	3.32%		
ARSENIC		NR	—	NR	—	—	5.38	1.42E-04	2.04E-03	2.04E-05	1.62E-04	0.03	<0.01	3.08%		
BARIUM		NR	—	NR	—	—	179.14	4.73E-03	0.12	1.23E-03	0.01	1.65	<0.01	2.33%		
ZINC		159.13	0.13	28.74	—	2.87E-03	85.55	2.26E-03	0.05	5.07E-04	0.14	48.70	<0.01	1.85%		
LEAD		4.95	4.16E-03	1.79	1.79E-04	48.00	1.27E-03	3.47E-03	3.47E-05	0.01	2.43	<0.01	1.50%			
THALLIUM		NR	—	NR	—	—	0.66	1.73E-05	1.96E-03	1.97E-05	3.70E-05	0.03	<0.01	0.91%		
MERCURY		ND	—	ND	—	—	0.05	1.42E-06	1.18E-04	1.18E-06	2.60E-06	2.12E-03	<0.01	0.79%		
MOLYBDENUM		NR	—	NR	—	—	1.93	5.08E-05	0.02	2.10E-04	2.61E-04	0.50	<0.01	0.33%		
MANGANESE		NR	—	NR	—	—	312.55	0.01	0.06	6.27E-04	0.01	26.78	<0.01	0.21%		
BERYLLIUM		NR	—	NR	—	—	1.26	3.32E-05	9.07E-04	9.08E-06	4.23E-05	0.20	<0.01	0.14%		
COBALT		NR	—	NR	—	—	8.34	2.20E-04	0.01	6.73E-05	2.88E-04	1.51	<0.01	0.12%		
TIN		NR	—	NR	—	—	43.09	1.14E-03	0.02	2.38E-04	1.38E-03	7.55	<0.01	0.12%		
LITHIUM		NR	—	NR	—	—	9.47	2.50E-04	0.02	2.05E-04	4.55E-04	2.86	<0.01	0.10%		
SILVER		ND	—	9.24	9.24E-04	ND	—	3.41E-03	3.41E-05	9.59E-04	6.71	<0.01	0.09%			
ACROCLOR-1254		NR	—	NR	1.82E-03	1.80E-07	0.26	6.80E-06	ND	—	6.98E-06	0.06	<0.01	0.08%		
TOTAL XYLENES		NR	—	NR	NR	—	NR	—	2.51E-03	2.51E-05	2.51E-05	0.28	<0.01	0.06%		
STRONTIUM		NR	—	NR	—	—	61.65	1.63E-03	0.41	4.13E-03	0.01	80.04	<0.01	0.05%		
NICKEL		NR	—	NR	—	—	29.86	7.88E-04	0.01	7.61E-05	8.64E-04	12.17	<0.01	0.05%		
BENZO(a)PYRENE		NR	—	NR	4.10E-03	4.10E-07	0.31	8.22E-06	ND	—	8.63E-06	0.14	<0.01	0.04%		
BIS(2-ETHYLHEXYL)PHTHALATE		NR	—	NR	ND	—	ND	—	0.02	1.51E-04	1.51E-04	2.48	<0.01	0.04%		
BENZYL ALCOHOL		NR	—	NR	1.82	1.82E-04	0.20	5.37E-06	ND	—	1.87E-04	3.13	<0.01	0.04%		
ACROCLOR-1248		NR	—	NR	1.40E-03	1.40E-07	0.12	3.26E-06	ND	—	3.40E-06	0.06	<0.01	0.04%		
DIBENZO(a,h)ANTHRACENE		NR	—	NR	1.54E-03	1.50E-07	0.19	4.99E-06	ND	—	5.14E-06	0.14	<0.01	0.02%		
ACETONE		NR	—	NR	NR	—	NR	—	0.01	7.01E-05	7.01E-05	3.04	<0.01	0.01%		
METHYLENE CHLORIDE		NR	—	NR	NR	—	NR	—	3.79E-03	3.79E-05	3.79E-05	1.78	<0.01	0.01%		
TETRACHLOROETHENE		NR	—	NR	NR	—	NR	—	2.82E-03	2.82E-05	2.82E-05	1.87	<0.01	0.01%		
1,2-DICHLOROETHENE		NR	—	NR	NR	—	NR	—	2.50E-03	2.51E-05	2.51E-05	2.27	<0.01	0.01%		
1,1-DICHLOROETHENE		NR	—	NR	NR	—	NR	—	2.53E-03	2.54E-05	2.54E-05	2.50	<0.01	0.01%		
CARBON DISULFIDE		NR	—	NR	NR	—	NR	—	2.57E-03	2.58E-05	2.58E-05	3.32	<0.01	0.01%		
TOLUENE		NR	—	NR	NR	—	NR	—	2.64E-03	2.64E-05	2.64E-05	3.51	<0.01	<0.01%		
ALDRIN		NR	—	NR	ND	—	ND	—	4.20E-05	4.20E-07	4.20E-07	0.06	<0.01	<0.01%		
BENZO(a)ANTHRACENE		NR	—	NR	4.92E-03	4.90E-07	0.33	8.63E-06	ND	—	9.12E-06	1.35	<0.01	<0.01%		
BENZO(b)FLUORANTHENE		NR	—	NR	1.94E-03	1.90E-07	0.31	8.28E-06	ND	—	8.47E-06	1.35	<0.01	<0.01%		
BENZO(k)FLUORANTHENE		NR	—	NR	1.26E-03	1.30E-07	0.30	7.85E-06	ND	—	7.98E-06	1.35	<0.01	<0.01%		
INDENO(1,2,3- <i>cd</i>)PYRENE		NR	—	NR	2.79E-04	3.00E-08	0.20	5.37E-06	ND	—	5.40E-06	1.35	<0.01	<0.01%		
1,2-DICHLOROETHANE		NR	—	NR	NR	—	NR	—	2.66E-03	2.66E-05	2.66E-05	7.12	<0.01	<0.01%		

Summary of Ecotoxicological Risk to Coyotes in the 881 Hillsides Source Area at RFETS

COYOTE 881 HILLSIDE		EXPOSURE POINT										SUMMARY			
		Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Intake	Hazard Reference Value	Percent of Quotient	Total Risk	
Analyte		UCL ₉₅ IR = 0.042 FI = 0.02	Intake	UCL ₉₅ IR = 0.005 FI = 0.02	Estimated Value	Intake	UCL ₉₅ IR = 0.00132 FI = 0.02	Intake	UCL ₉₅ IR = 0.077 FI = 0.13	—	2.14E-05	10.00	<0.01	<0.01%	
PYRENE	NR	—	NR	0.03	3.07E-06	0.69	1.83E-05	ND	—	2.14E-05	10.00	<0.01	<0.01	<0.01%	
CHROMIUM	ND	—	5.71	5.71E-04	35.00	9.24E-04	3.95E-03	3.96E-05	1.53E-03	833.00	<0.01	<0.01	<0.01	<0.01%	
FLUORANTHENE	NR	—	NR	0.03	2.84E-06	0.76	2.01E-05	ND	—	2.30E-05	16.66	<0.01	<0.01	<0.01%	
TRICHLOROETHENE	NR	—	NR	NR	—	NR	—	2.58E-03	2.59E-05	2.59E-05	19.58	<0.01	<0.01	<0.01%	
1,1-DICHLOROETHANE	NR	—	NR	NR	—	NR	—	2.51E-03	2.51E-05	2.51E-05	30.20	<0.01	<0.01	<0.01%	
CHRYSENE	NR	—	NR	0.01	8.00E-07	0.36	9.52E-06	ND	—	1.03E-05	13.50	<0.01	<0.01	<0.01%	
ETHYLBENZENE	NR	—	NR	NR	—	NR	—	2.50E-03	2.51E-05	2.51E-05	41.08	<0.01	<0.01	<0.01%	
FLUORENE	NR	—	NR	0.03	2.86E-06	0.19	5.09E-06	ND	—	7.95E-06	16.66	<0.01	<0.01	<0.01%	
BENZ(ghi)PERYLENE	NR	—	NR	0.00	6.00E-08	0.21	5.42E-06	ND	—	5.48E-06	13.50	<0.01	<0.01	<0.01%	
ACENAPHTHENE	NR	—	NR	0.03	3.10E-06	0.19	5.15E-06	ND	—	8.25E-06	23.32	<0.01	<0.01	<0.01%	
1,1,1-TRICHLOROETHANE	NR	—	NR	NR	—	NR	—	2.52E-03	2.52E-05	2.52E-05	142.35	<0.01	<0.01	<0.01%	
PHENANTHRENE	NR	—	NR	0.05	5.28E-06	0.56	1.48E-05	ND	—	2.00E-05	135.03	<0.01	<0.01	<0.01%	
2-BUTANONE	NR	—	NR	NR	—	NR	—	0.01	5.23E-05	5.23E-05	534.88	<0.01	<0.01	<0.01%	
NAPHTHALENE	NR	—	NR	0.09	8.62E-06	0.19	5.14E-06	ND	—	1.38E-05	135.03	<0.01	<0.01	<0.01%	
ANTHRACENE	NR	—	NR	0.02	2.10E-06	0.20	5.34E-06	ND	—	7.44E-06	133.27	<0.01	<0.01	<0.01%	

HAZARD INDEX 0.15

Summary of Ecotoxicological Risk to Coyotes in the Old Landfill Source Area at RFETS

COYOTE OLD LANDFILL	EXPOSURE POINT										SUMMARY					
	Small Mammal			Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCI ₋₉₅	Intake	UCI ₉₅	IR = 0.005 FI = 0.012	Estimated Value	Intake	UCI ₉₅	Intake	UCI ₉₅	Intake	UCI ₉₅	IR = 0.00132 FI = 0.012	IR = 0.077 FI = 0.096			
Analyte																
MAGNESIUM	431.43	0.22	199.13	0.01	11074.66	0.18	1.37E-04	0.02	1.11E-04	2.49E-04	2.27E-03	1.68E-05	4.18E-04	0.02	14.93%	
ALUMINUM	ND	—	ND	—	8.68	—	5.70	9.03E-05	2.27E-03	1.68E-05	4.18E-04	0.03	0.01	13.14%		
ANTIMONY	ND	—	5.18	3.11E-04	—	—	30.43	4.82E-04	0.01	6.43E-05	1.46E-03	0.13	0.01	10.99%		
ARSENIC	ND	—	15.23	9.14E-04	0.01	7.35	1.16E-04	0.02	1.55E-04	0.01	—	—	—	0.01	10.31%	
VANADIUM	ND	—	91.51	0.01	3.99E-03	115.59	1.83E-03	0.17	1.23E-03	0.01	—	—	—	0.01	10.24%	
MOLYBDENUM	10.07	0.01	66.46	4.72E-04	37.70	5.97E-04	0.01	4.47E-05	0.02	—	—	—	5.04	<0.01	6.57%	
BARIUM	31.63	0.02	7.86	0.00E+00	NR	—	NR	—	1.49	0.01	0.01	3.97	<0.01	0.01	3.03%	
COPPER	NR	—	NR	44.21	2.65E-03	66.57	1.05E-03	0.02	1.53E-04	0.07	48.70	<0.01	48.70	<0.01	2.49%	
NITRATE/NITRITE	ZINC	130.10	0.07	2.35	1.41E-04	0.88	1.39E-05	1.74E-03	1.28E-05	1.68E-04	0.12	<0.01	—	<0.01	1.26%	
CADMIUM	ND	—	2.37	1.42E-04	0.46	7.27E-06	2.69E-03	1.99E-05	1.69E-04	0.12	<0.01	—	<0.01	1.25%		
SELENIUM	ND	—	ND	—	0.12	1.96E-06	1.12E-04	8.30E-07	2.79E-06	2.12E-03	<0.01	—	<0.01	1.23%		
MERCURY	ND	—	52.01	3.12E-03	8.00	1.27E-04	0.01	9.77E-05	3.35E-03	2.86	<0.01	—	—	<0.01	1.18%	
LITHIUM	4.36	2.20E-03	1.68	1.01E-04	28.70	4.55E-04	4.24E-03	3.14E-05	2.79E-03	2.43	<0.01	—	—	<0.01	1.05%	
LEAD	ND	—	ND	—	0.91	1.44E-05	2.11E-03	1.56E-05	3.00E-05	0.03	<0.01	—	<0.01	1.03%		
THALLIUM	NICKEL	22.57	0.01	14.10	8.46E-04	14.94	2.37E-04	0.01	7.04E-05	0.01	12.17	<0.01	—	<0.01	0.92%	
TIN	ND	—	95.41	0.01	9.71	1.54E-04	0.02	1.59E-04	0.01	7.55	<0.01	—	—	<0.01	0.72%	
MANGANESE	8.23	4.15E-03	47.24	2.83E-03	277.66	4.40E-03	0.06	4.73E-04	0.01	26.78	<0.01	—	—	<0.01	0.40%	
BENZO(a)PYRENE	NR	—	NR	0.03	2.08E-06	2.64	4.18E-05	ND	—	4.38E-05	0.14	<0.01	—	<0.01	0.29%	
STRONTIUM	29.98	0.02	79.00	4.74E-03	30.81	4.88E-04	0.49	3.66E-03	0.02	80.04	<0.01	—	<0.01	—	0.27%	
PENTACHLOROPHENOL	NR	—	NR	ND	—	ND	—	0.03	1.98E-04	0.91	<0.01	—	<0.01	0.20%		
AROCLOR-1254	NR	—	NR	4.04E-03	2.40E-07	0.57	9.06E-06	ND	—	9.30E-06	0.06	<0.01	—	<0.01	0.14%	
COBALT	ND	—	ND	—	8.35	1.32E-04	0.01	6.09E-05	1.93E-04	1.51	<0.01	—	—	<0.01	0.11%	
BERYLLIUM	ND	—	ND	—	0.88	1.40E-05	9.86E-04	7.29E-06	2.13E-05	0.20	<0.01	—	—	<0.01	0.09%	
DIBENZO(a,h)ANTHRACENE	NR	—	NR	0.01	3.70E-07	0.76	1.20E-05	ND	—	1.24E-05	0.14	<0.01	—	—	0.08%	
SILVER	ND	—	5.16	3.10E-04	7.18	1.14E-04	3.64E-03	2.69E-05	4.51E-04	6.71	<0.01	—	—	<0.01	0.06%	
ACETONE	NR	—	NR	ND	—	ND	—	0.02	1.77E-04	1.77E-04	3.04	<0.01	—	—	0.05%	
BENZO(b)FLUORANTHENE	NR	—	NR	0.02	1.18E-06	3.18	5.04E-05	ND	—	5.15E-05	1.35	<0.01	—	—	0.03%	
BENZO(a)ANTHRACENE	NR	—	NR	0.04	2.58E-06	2.85	4.51E-05	ND	—	4.77E-05	1.35	<0.01	—	—	0.03%	
DIELDRIN	NR	—	NR	8.62E-04	5.00E-08	0.01	1.50E-07	ND	—	2.00E-07	0.01	<0.01	—	—	0.03%	
INDENO(1,2,3- <i>cd</i>)PYRENE	NR	—	NR	3.53E-03	2.10E-07	2.57	4.07E-05	ND	—	4.10E-05	1.35	<0.01	—	—	0.03%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	0.02	1.45E-06	0.30	4.83E-06	0.01	6.70E-05	7.33E-05	2.48	<0.01	—	—	0.03%	
ENDRIN KETONE	NR	—	NR	NO LOG _{KOW}	—	0.01	1.50E-07	ND	—	1.50E-07	0.01	<0.01	—	—	0.01%	
BENZO(k)FLUORANTHENE	NR	—	NR	0.01	4.30E-07	1.69	2.68E-05	ND	—	2.73E-05	1.35	<0.01	—	—	0.02%	
PYRENE	NR	—	NR	0.31	1.88E-05	7.09	1.12E-04	ND	—	1.31E-04	10.00	<0.01	—	—	0.01%	
METHYLENE CHLORIDE	NR	—	NR	ND	—	ND	—	3.11E-03	2.30E-05	2.30E-05	1.78	<0.01	—	—	0.01%	
FLUORANTHENE	NR	—	NR	0.31	1.85E-05	8.27	1.31E-04	ND	—	1.49E-04	16.66	<0.01	—	—	0.01%	
CHLOROFORM	NR	—	NR	ND	—	ND	—	2.54E-03	1.88E-05	1.88E-05	4.57	<0.01	—	—	<0.01%	
CHRYSENE	NR	—	NR	0.07	3.97E-06	2.99	4.73E-05	ND	—	5.13E-05	13.50	<0.01	—	—	<0.01%	
FLUORENE	NR	—	NR	0.35	2.11E-05	2.36	3.74E-05	ND	—	5.85E-05	16.66	<0.01	—	—	<0.01%	
ACENAPHTHENE	NR	—	NR	0.42	2.51E-05	2.64	4.18E-05	ND	—	6.69E-05	23.32	<0.01	—	—	<0.01%	
ENDOSULFAN SULFATE	NR	—	NR	2.60E-03	1.60E-07	0.01	1.40E-07	ND	—	3.00E-07	0.10	<0.01	—	—	<0.01%	

Summary of Ecotoxicological Risk to Coyotes in the Old Landfill Source Area at RFETS

COYOTE OLD LANDFILL	EXPOSURE POINT												SUMMARY			
	Small Mammal			Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00132	IR = 0.077	IR = 0.096	Fl = 0.096	
Analyte	IR = 0.042	—	IR = 0.005	—	—	—	—	—	—	—	—	—	—	—	—	<0.01%
PHENANTHRENE	Fl = 0.012	—	Fl = 0.012	—	—	—	—	—	—	—	—	—	—	—	—	<0.01%
ALDRIN	NR	—	NR	0.91	5.47E-05	9.64	1.53E-04	ND	—	2.07E-04	135.03	<0.01	—	—	—	<0.01%
HEPTACHLOR EPOXIDE	NR	—	NR	1.16E-04	1.00E-08	4.66E-03	7.00E-08	ND	—	8.00E-08	0.06	<0.01	—	—	—	<0.01%
METHOXYCHLOR	NR	—	NR	1.29E-03	8.00E-08	4.30E-03	7.00E-08	ND	—	—	—	—	—	—	—	<0.01%
TRICHLOROETHENE	NR	—	NR	0.01	4.00E-07	0.06	9.50E-07	ND	—	1.50E-07	0.12	<0.01	—	—	—	<0.01%
BENZO(g,h)PERYLENE	NR	—	NR	NR	—	—	—	ND	—	—	—	—	—	—	—	<0.01%
NAPHTHALENE	NR	—	NR	2.81E-03	1.70E-07	0.92	1.46E-05	ND	—	1.35E-06	1.21	<0.01	—	—	—	<0.01%
BUTYL BENZYL PHTHALATE	NR	—	NR	1.11	6.63E-05	2.50	3.96E-05	ND	—	1.48E-05	19.58	<0.01	—	—	—	<0.01%
4,4'-DDT	NR	—	NR	0.02	1.36E-06	0.34	5.36E-06	ND	—	1.06E-04	13.50	<0.01	—	—	—	<0.01%
CHROMIUM	NR	—	NR	8.80E-05	1.00E-08	0.01	1.40E-07	ND	—	—	135.03	<0.01	—	—	—	<0.01%
ANTHRACENE	ND	—	4.09	2.45E-04	13.09	2.07E-04	4.51E-03	3.34E-05	—	6.72E-06	10.69	<0.01	—	—	—	<0.01%
2-METHYLNAPHTHALENE	NR	—	NR	0.29	1.75E-05	2.82	4.46E-05	ND	—	1.50E-07	0.24	<0.01	—	—	—	<0.01%
Di-n-BUTYL PHTHALATE	NR	—	NR	0.15	9.24E-06	0.94	1.50E-05	ND	—	4.86E-04	833.00	<0.01	—	—	—	<0.01%
2-BUTANONE	NR	—	NR	0.03	1.66E-06	0.31	4.95E-06	ND	—	6.21E-05	133.27	<0.01	—	—	—	<0.01%
DIETHYL PHTHALATE	NR	—	NR	ND	—	ND	—	—	—	2.42E-05	135.03	<0.01	—	—	—	<0.01%
Di-n-OCTYL PHTHALATE	NR	—	NR	ND	—	ND	—	0.01	4.18E-05	4.18E-05	74.41	<0.01	—	—	—	<0.01%
	NR	—	NR	6.20E-05	0	0.33	5.28E-06	ND	—	3.76E-05	534.88	<0.01	—	—	—	<0.01%
									—	5.28E-06	139.38	<0.01	—	—	—	<0.01%

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Summary of Ecotoxicological Risk to Coyotes in the OU7 Downgradient Areas Source Area at RFETS

COYOTE OUT DOWNGRADIENT AREAS		EXPOSURE POINT						SUMMARY					
		Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	UCI ₉₅	Intake	UCI ₉₅	Estimated Value	Intake	UCI ₉₅	Intake	UCI ₉₅	Intake	IR = I	FI = I		
SELENIUM	IR = 0.042 FI = 0.002	2.84E-03 33.86	4.40 2.68E-03	IR = 0.005 FI = 0.002	4.40E-05 23.12	2.31E-04 2.50	NR —	— NR	— 0.01	— 0.12	2.89E-03 0.13	0.02 0.02	21.67% 21.17%
VANADIUM	31.98	2.68E-03	23.12	IR = 0.005 FI = 0.002	2.31E-04 2.50E-05	NR —	— NR	— 1.15E-04	— —	2.92E-03 2.01E-03	0.13 0.12	0.02 0.02	15.45% 13.19%
CADMIUM	23.67	1.98E-03	2.50	ND	—	NR —	— NR	— —	— 3.04E-05	— 0.00	— 0.01	— 0.01	— 10.72%
MERCURY	0.36	3.04E-05	ND	—	0.03	NR —	— 25.70	— —	— 0.51	— 44.17	— 0.01	— 0.01	— 4.25%
MAGNESIUM	5812.75	0.49	2549.84	—	0.03	NR —	— 25.70	— —	— 0.51	— 44.17	— 0.01	— 0.01	— 2.55%
BARIUM	84.54	0.01	52.80	—	5.28E-04	NR —	— 0.19	— —	— 0.01	— 1.65	— 0.01	— 0.01	— 2.30%
ALUMINUM	798.32	0.07	212.41	—	2.12E-03	NR —	— 0.40	— —	— 0.07	— 25.01	— 0.01	— 0.01	— 2.30%
LEAD	72.19	0.01	1.53	—	1.53E-05	NR —	— 0.01	— —	— 0.01	— 2.43	— 0.01	— 0.01	— 2.15%
COPPER	135.22	0.01	42.78	—	4.28E-04	NR —	— 0.01	— —	— 0.01	— 5.04	— 0.01	— 0.01	— 1.33%
MOLYBDENUM	ND	—	103.42	—	1.03E-03	NR —	— 0.03	— —	— 0.03	— 1.03E-03	— 0.50	— 0.01	— 1.89%
ZINC	938.96	0.08	32.78	—	3.28E-04	NR —	— 0.06	— —	— 0.08	— 48.70	— 0.01	— 0.01	— 1.50%
ARSENIC	ND	—	4.93	—	4.93E-05	NR —	— 3.31E-03	— —	— 4.93E-05	— 0.03	— 0.01	— 0.01	— 1.33%
TIN	66.89	0.01	98.49	—	9.85E-04	NR —	— 0.03	— —	— 0.01	— 7.55	— 0.01	— 0.81%	— 0.35%
SILVER	30.35	2.55E-03	ND	—	—	NR —	— ND	— —	— 0.01	— 2.55E-03	— 6.71	— 0.01	— 0.24%
MANGANESE	81.47	0.01	18.57	—	1.86E-04	NR —	— 0.08	— —	— 0.01	— 26.78	— 0.01	— 0.01	— 0.15%
STRONTIUM	147.72	0.01	91.65	—	9.16E-04	NR —	— 0.77	— —	— 0.01	— 80.04	— 0.01	— 0.01	— 0.14%
LITHIUM	ND	—	43.21	—	4.32E-04	NR —	— 0.03	— —	— 0.03	— 4.32E-04	— 2.86	— 0.01	— 0.01
BERYLLIUM	ND	—	2.59	—	2.59E-05	NR —	— ND	— —	— 0.20	— 2.59E-05	— 0.20	— 0.01	— 0.12%
NICKEL	ND	—	18.74	—	1.87E-04	NR —	— 0.01	— —	— 1.87E-04	— 12.17	— 0.01	— 0.01	— 0.01%
NITRATE/NITRITE	NR	—	NR	—	10.78	2.85E-05	1.06	—	2.85E-05	3.97	<0.01	<0.01	— 0.01%
CHROMIUM	37.27	3.13E-03	7.41	—	7.41E-05	NR —	— ND	— —	— 3.21E-03	833.00	<0.01	<0.01	— 0.01%

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Summary of Ecotoxicological Risk to Coyotes in the Ash Pits Source Area at RFETS

COYOTE ASH PITS		EXPOSURE POINT										SUMMARY				
		Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Value	Hazard Quotient	Percent of Total Risk			
Analyte		UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00132 FI = 0.017	IR = 0.077 FI = 0.063				
ALUMINUM		IR = 0.042 FI = 0.017	0.30	264.44	0.02	13038.84	0.29	0.86	4.15E-03	0.61	25.01	0.02	23.04%			
MAGNESIUM		776.81	0.55	1466.88	0.12	2929.96	0.07	6.86	0.03	0.78	44.17	0.02	16.53%			
VANADIUM		ND	—	15.94	1.35E-03	36.21	8.13E-04	0.01	4.17E-05	2.21E-03	0.13	0.02	16.32%			
ARSENIC		ND	—	4.47	3.80E-04	5.72	1.28E-04	2.09E-03	1.01E-05	5.18E-04	0.03	0.02	14.25%			
BARIUM		9.86	0.01	66.75	0.01	143.89	3.23E-03	0.07	3.42E-04	0.02	1.65	0.01	9.23%			
MERCURY		ND	—	0.10	8.28E-06	0.08	1.74E-06	1.10E-04	5.30E-07	1.06E-05	0.00	<0.01	4.67%			
ANTIMONY		ND	—	ND	—	ND	—	0.02	7.45E-05	7.45E-05	0.02	<0.01	4.12%			
COPPER		21.42	0.02	7.60	6.46E-04	16.94	3.80E-04	0.01	2.74E-05	0.02	5.04	<0.01	3.04%			
CADMIUM		ND	—	2.18	1.85E-04	1.35	3.03E-05	1.49E-03	7.23E-06	2.23E-04	0.12	<0.01	1.74%			
ZINC		78.51	0.06	29.22	2.48E-03	69.63	1.56E-03	0.02	8.69E-05	0.06	48.70	<0.01	1.16%			
BERYLLIUM		ND	—	2.53	2.15E-04	0.94	2.11E-05	1.37E-03	6.64E-06	2.43E-04	0.20	<0.01	1.13%			
LEAD		2.69	1.92E-03	1.58	1.34E-04	33.78	7.58E-04	3.78E-03	1.83E-05	2.83E-03	2.43	<0.01	1.09%			
TIN		ND	—	92.82	0.01	16.66	3.74E-04	0.02	1.05E-04	0.01	7.55	<0.01	1.04%			
THALLIUM		ND	—	ND	—	0.91	2.05E-05	ND	—	2.05E-05	0.03	<0.01	0.73%			
MANGANESE		11.94	0.01	42.73	3.63E-03	337.52	0.01	0.15	7.17E-04	0.02	26.78	<0.01	0.72%			
STRONTIUM		20.61	0.01	45.07	3.83E-03	38.77	8.70E-04	0.25	1.20E-03	0.02	80.04	<0.01	0.24%			
MOLYBDENUM		ND	—	ND	—	0.93	2.08E-05	0.02	9.57E-05	1.16E-04	0.50	<0.01	0.22%			
SELENIUM		ND	—	ND	—	0.41	9.20E-06	1.98E-03	9.59E-06	1.88E-05	0.12	<0.01	0.14%			
COBALT		ND	—	ND	—	8.40	1.89E-04	0.01	3.56E-05	2.24E-04	1.51	<0.01	0.14%			
NICKEL		ND	—	14.80	1.26E-03	13.58	3.05E-04	0.01	4.23E-05	1.61E-03	12.17	<0.01	0.12%			
NITRATE/NITRITE		NR	—	NR	—	NR	—	0.09	4.29E-04	4.29E-04	3.97	<0.01	0.10%			
LITHIUM		ND	—	ND	—	10.38	2.33E-04	0.01	7.24E-05	3.05E-04	2.86	<0.01	0.10%			
SILVER		ND	—	5.09	4.33E-04	1.81	4.05E-05	3.22E-03	1.56E-05	4.89E-04	6.71	<0.01	0.07%			
BIS(2-ETHYLHEXYL)PHTHALATE		NR	—	NR	NR	—	NR	—	0.01	6.41E-05	2.48	<0.01	0.02%			
ACETONE		NR	—	NR	NR	—	NR	—	0.01	4.35E-05	3.04	<0.01	0.01%			
METHYLENE CHLORIDE		NR	—	NR	NR	—	NR	—	4.74E-03	2.30E-05	1.78	<0.01	0.01%			
CARBON DISULFIDE		NR	—	NR	NR	—	NR	—	2.74E-03	1.33E-05	3.32	<0.01	<0.01%			
1,2-DICHLOROETHANE		NR	—	NR	NR	—	NR	—	3.07E-03	1.49E-05	7.12	<0.01	<0.01%			
CHROMIUM		ND	—	4.65	3.95E-04	15.96	3.58E-04	3.90E-03	1.89E-05	7.72E-04	833.00	<0.01	<0.01%			
DIETHYL PHthalate		NR	—	NR	NR	—	NR	—	0.01	2.58E-05	2.58E-05	620.06	<0.01	<0.01%		

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Summary of Ecotoxicological Risk to Coyotes in the North Spray Field Source Area at RFETS

COYOTE NORTH SPRAY FIELD		EXPOSURE POINT										SUMMARY				
		Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk			
Analyte	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I / F1	IR = I / F1	IR = I / F1	IR = I / F1			
THALLIUM	NR	—	4.77	0.00	0.93	0.00	NR	—	0.00	0.03	0.03	34.17%				
VANADIUM	NR	—	13.00	0.00	33.08	0.00	NR	—	0.00	0.13	0.02	20.61%				
MAGNESIUM	NR	—	4253.48	0.80	2325.99	0.01	NR	—	0.81	44.17	0.02	18.38%				
BARIUM	NR	—	83.89	0.02	169.61	0.00	NR	—	0.02	1.65	0.01	10.07%				
ALUMINUM	NR	—	347.54	0.07	11487.90	0.06	NR	—	0.13	25.01	0.01	5.04%				
ANTIMONY	NR	—	ND	—	15.43	0.00	NR	—	0.00	0.02	<0.01	4.80%				
CADMIUM	NR	—	2.68	0.00	0.99	0.00	NR	—	0.00	0.12	<0.01	4.24%				
ARSENIC	NR	—	ND	—	6.62	0.00	NR	—	0.00	0.03	<0.01	1.02%				
NICKEL	NR	—	23.10	0.00	15.06	0.00	NR	—	0.00	12.17	<0.01	3.36%				
MANGANESE	NR	—	35.25	0.01	319.60	0.00	NR	—	0.01	26.78	<0.01	0.31%				
COPPER	NR	—	6.54	0.00	14.01	0.00	NR	—	0.00	5.04	<0.01	0.26%				
LEAD	NR	—	1.76	0.00	40.40	0.00	NR	—	0.00	2.43	<0.01	0.22%				
STRONTIUM	NR	—	76.34	0.01	31.03	0.00	NR	—	0.01	80.04	<0.01	0.18%				
MERCURY	NR	—	ND	—	0.07	0.00	NR	—	0.00	0.00	<0.01	0.16%				
ZINC	NR	—	21.24	0.00	48.93	0.00	NR	—	0.00	48.70	<0.01	0.09%				
COBALT	NR	—	ND	—	9.70	0.00	NR	—	0.00	1.51	<0.01	0.03%				
SELENIUM	NR	—	ND	—	0.58	0.00	NR	—	0.00	0.12	<0.01	0.02%				
BERYLLIUM	NR	—	ND	—	0.63	0.00	NR	—	0.00	0.20	<0.01	0.02%				
LITHIUM	NR	—	ND	—	6.56	0.00	NR	—	0.00	2.86	<0.01	0.01%				
CHROMIUM	NR	—	ND	—	12.82	0.00	NR	—	0.00	833.00	<0.01	<0.01%				

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Summary of Ecotoxicological Risk to Coyotes in the C-Ponds Source Area at RFETS

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COYOTE C-PONDS	EXPOSURE POINT										SUMMARY			
	Small Mammal		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	IR = 0.00132	IR = 0.077	IR = 0.198	IR = 0.072%		
Analyte	IR = 0.042 FI = 0.01	IR = 0.005 FI = 0.01	IR = 0.005 FI = 0.01	—	—	NC	—	1.85E-03	2.83E-05	3.37E-03	0.12	0.03	36.72%	
SELENIUM	7.96	3.34E-03	ND	—	—	ND	—	0.02	2.35E-04	2.35E-04	0.02	0.01	18.47%	
ANTIMONY	NR	—	NR	—	—	1.24E-04	ND	—	2.59E-03	3.95E-05	1.58E-03	0.12	0.01	17.60%
CADMIUM	3.37	1.42E-03	2.48	—	—	—	NC	—	10.77	0.16	44.17	<0.01	4.91%	
MAGNESIUM	NR	—	NR	—	—	—	—	0.05	7.39E-04	0.14	48.70	<0.01	3.90%	
ZINC	331.68	0.14	41.40	2.07E-03	NC	—	—	—	—	—	—	—	—	
NITRATE/NITRITE	NR	—	NR	—	NR	—	0.54	0.01	0.01	3.97	<0.01	0.01	2.78%	
COPPER	21.04	0.01	8.93	4.46E-04	NC	—	0.01	1.22E-04	0.01	5.04	<0.01	0.01	2.49%	
ALUMINUM	NR	—	NR	—	NC	—	2.43	0.04	0.04	25.01	<0.01	0.01	1.93%	
VANADIUM	NR	—	NR	—	NC	—	0.01	1.76E-04	1.76E-04	0.13	<0.01	0.01	1.86%	
THALLIUM	NR	—	NR	—	ND	—	2.34E-03	3.56E-05	3.56E-05	0.03	<0.01	0.01	1.80%	
LEAD	6.57	2.76E-03	1.36	6.78E-05	NC	—	0.01	9.62E-05	2.92E-03	2.43	<0.01	0.01	1.61%	
MERCURY	ND	—	ND	—	ND	—	1.41E-04	2.15E-06	2.15E-06	2.12E-03	<0.01	0.01	1.36%	
BARIUM	NR	—	NR	—	NC	—	0.11	1.66E-03	1.66E-03	1.65	<0.01	0.01	1.35%	
ARSENIC	NR	—	NR	—	NC	—	0.23	2.23E-03	3.39E-05	0.03	<0.01	0.01	1.33%	
MOLYBDENUM	NR	—	NR	—	ND	—	0.02	3.58E-04	3.58E-04	0.50	<0.01	0.01	0.95%	
LITHIUM	NR	—	NR	—	NC	—	0.02	3.16E-04	3.16E-04	2.86	<0.01	0.01	0.15%	
COBALT	NR	—	NR	—	NC	—	0.01	1.21E-04	1.21E-04	1.51	<0.01	0.01	0.11%	
BERYLLIUM	NR	—	NR	—	ND	—	9.99E-04	1.52E-05	1.52E-05	0.20	<0.01	0.01	0.10%	
ACETONE	NR	—	NR	—	NR	—	0.01	2.21E-04	2.21E-04	3.04	<0.01	0.01	0.10%	
MANGANESE	NR	—	NR	—	NC	—	0.12	1.83E-03	1.83E-03	26.78	<0.01	0.01	0.09%	
STRONTIUM	NR	—	NR	—	NC	—	0.34	5.14E-03	0.01	80.04	<0.01	0.01	0.09%	
TIN	NR	—	NR	—	NC	—	0.02	3.27E-04	3.27E-04	7.55	<0.01	0.01	0.06%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	ND	—	0.01	8.21E-05	8.21E-05	2.48	<0.01	0.01	0.04%		
METHYLENE CHLORIDE	NR	—	NR	NR	—	NR	—	3.67E-03	5.59E-05	5.59E-05	1.78	<0.01	0.04%	
CARBON DISULFIDE	NR	—	NR	NR	—	NR	—	2.52E-03	3.84E-05	3.84E-05	3.32	<0.01	0.02%	
TOLUENE	NR	—	NR	NR	—	NR	—	2.52E-03	3.84E-05	3.84E-05	3.51	<0.01	0.01	
NICKEL	NR	—	NR	—	NR	—	0.01	1.32E-04	1.32E-04	12.17	<0.01	0.01	0.01	
CHLOROFORM	NR	—	NR	—	NR	—	—	2.57E-03	3.92E-05	4.57	<0.01	0.01	0.01	
SILVER	ND	—	ND	—	ND	—	3.60E-03	5.49E-05	5.49E-05	6.71	<0.01	0.01	0.01	
CHROMIUM	5.36	2.25E-03	10.96	5.48E-04	NC	—	4.76E-03	7.26E-05	2.87E-03	833.00	<0.01	<0.01	<0.01%	
2-BUTANONE	NR	—	NR	NR	—	NR	—	0.01	8.85E-05	8.85E-05	534.88	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Coyotes in the OU6 Burial Trenches Source Area at RFETS

COYOTE OU6 BURIAL TRENCHES	EXPOSURE POINT										SUMMARY				
	Small Mammal		Vegetation			Surficial Soil			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00132 FI = 0.001	IR = 1 FI = 1	IR = 0.00132 FI = 0.001	IR = 1 FI = 1		
Analyt:															
VANADIUM	IR = 0.042 FI = 0.001	1.34E-03	19.20	9.60E-05	NR	—	NR	—	1.43E-03	0.13	0.01	36.82%			
MAGNESIUM	7324.19	0.31	1586.86	0.01	NR	—	NR	—	0.32	44.17	0.01	23.30%			
ALUMINUM	1375.78	0.06	296.49	1.48E-03	NR	—	NR	—	0.06	25.01	<0.01	7.73%			
BARIUM	78.93	3.31E-03	48.77	2.44E-04	NR	—	NR	—	3.56E-03	1.65	<0.01	7.02%			
SELENIUM	4.58	1.92E-04	2.58	1.29E-05	NR	—	NR	—	2.05E-04	0.12	<0.01	5.45%			
COPPER	129.61	0.01	19.59	9.79E-05	NR	—	NR	—	0.01	5.04	<0.01	3.59%			
MOLYBDENUM	ND	—	102.91	5.15E-04	NR	—	NR	—	5.15E-04	0.50	<0.01	3.33%			
ZINC	1148.37	0.05	26.86	1.34E-04	NR	—	NR	—	0.05	48.70	<0.01	3.24%			
TIN	130.69	0.01	93.84	4.69E-04	NR	—	NR	—	0.01	7.55	<0.01	2.57%			
ARSENIC	ND	—	5.13	2.57E-05	NR	—	NR	—	2.57E-05	0.03	<0.01	2.45%			
LEAD	32.34	1.36E-03	1.18	5.92E-06	NR	—	NR	—	1.36E-03	2.43	<0.01	1.83%			
MERCURY	ND	—	0.10	5.10E-07	NR	—	NR	—	5.10E-07	0.00	<0.01	0.78%			
MANGANESE	131.94	0.01	21.32	1.07E-04	NR	—	NR	—	0.01	26.78	<0.01	0.69%			
CADMIUM	ND	—	2.40	1.20E-05	NR	—	NR	—	1.20E-05	0.12	<0.01	0.33%			
LITHIUM	ND	—	49.67	2.48E-04	NR	—	NR	—	2.48E-04	2.86	<0.01	0.28%			
STRONTIUM	130.26	0.01	50.06	2.50E-04	NR	—	NR	—	0.01	80.04	<0.01	0.23%			
BERYLLIUM	ND	—	2.54	1.27E-05	NR	—	NR	—	1.27E-05	0.20	<0.01	0.21%			
SILVER	6.28	2.64E-04	ND	—	NR	—	NR	—	2.64E-04	6.71	<0.01	0.13%			
NICKEL	ND	—	17.30	8.65E-05	NR	—	NR	—	8.65E-05	12.17	<0.01	0.02%			
CHROMIUM	30.22	1.27E-03	4.49	2.25E-05	NR	—	NR	—	1.29E-03	833.00	<0.01	0.01%			

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0.03

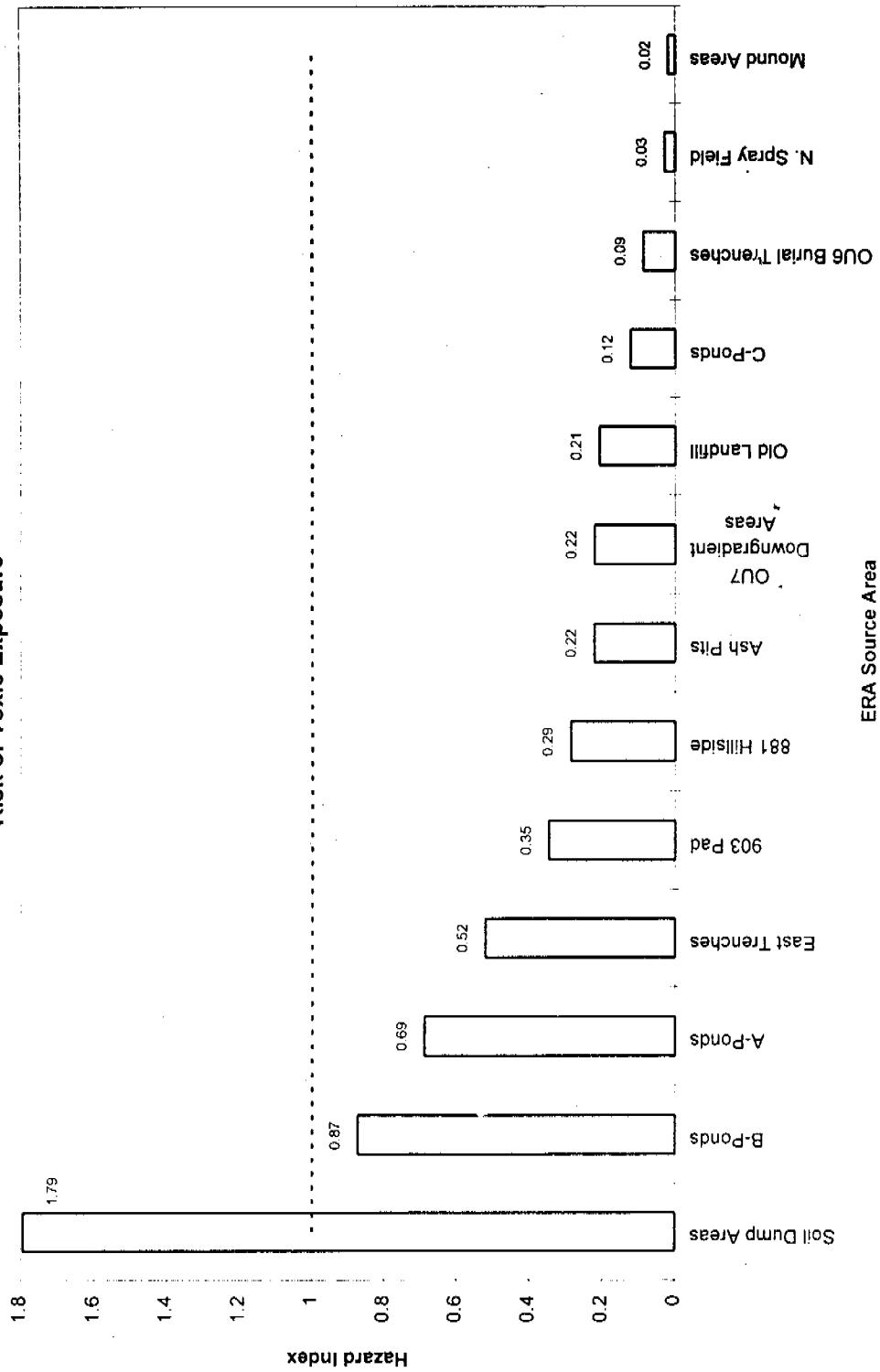
Summary of Ecotoxicological Risk to Coyotes in the Mound Area Source Area at RFETS

COYOTE MOULD AREA	EXPOSURE POINT										SUMMARY			
	Small Mammal		Vegetation		Surficial Soil		Surface Water		Toxicity		Hazard	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Estimated Value	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	Quotient			
Analyte	IR = NR	IR = 0.047	IR = 0.02	IR = 0.02	IR = 0.00132	IR = 0.02	IR = I	IR = I	IR = I	IR = I	<0.01	36.04%		
ALUMINUM	NR	—	NR	—	15228.01	0.04	NR	—	0.04	25.01	<0.01	23.66%		
VANADIUM	NR	—	NR	—	50.76	1.34E-04	NR	—	1.34E-04	0.13	<0.01	16.24%		
ARSENIC	NR	—	NR	—	9.35	2.47E-05	NR	—	2.47E-05	0.03	<0.01	5.74%		
BARIUM	NR	—	NR	—	160.34	4.23E-04	NR	—	4.23E-04	1.65	<0.01	5.22%		
THALLIUM	NR	—	NR	—	2.33	6.15E-06	NR	—	6.15E-06	0.03	<0.01			
MAGNESIUM	NR	—	NR	—	3527.10	0.01	NR	—	0.01	44.17	<0.01	4.73%		
AROCLOR-1254	NR	—	NR	0.021457	2.02E-06	3.04	8.03E-06	NR	—	1.01E-05	0.06	<0.01	3.84%	
AROCLOR-1260	NR	—	NR	0.006973	6.60E-07	1.78	4.69E-06	NR	—	5.35E-06	0.06	<0.01	2.04%	
MANGANESE	NR	—	NR	—	338.31	8.93E-04	NR	—	8.93E-04	26.78	<0.01	0.75%		
LEAD	NR	—	NR	—	19.45	5.14E-05	NR	—	5.14E-05	2.43	<0.01	0.47%		
COBALT	NR	—	NR	—	10.19	2.69E-05	NR	—	2.69E-05	1.51	<0.01	0.40%		
LITHIUM	NR	—	NR	—	11.19	2.96E-05	NR	—	2.96E-05	2.86	<0.01	0.23%		
COPPER	NR	—	NR	—	15.23	4.02E-05	NR	—	4.02E-05	5.04	<0.01	0.18%		
BENZO(a)PYRENE	NR	—	NR	0.002246	2.10E-07	0.17	4.50E-07	NR	—	6.60E-07	0.14	<0.01	0.11%	
STRONTIUM	NR	—	NR	—	129.27	3.41E-04	NR	—	3.41E-04	80.04	<0.01	0.10%		
ZINC	NR	—	NR	—	66.49	1.76E-04	NR	—	1.76E-04	48.70	<0.01	0.08%		
NICKEL	NR	—	NR	—	11.67	3.08E-05	NR	—	3.08E-05	12.17	<0.01	0.06%		
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	NR	0.042795	4.02E-06	0.54	1.42E-06	NR	—	5.44E-06	2.48	<0.01	0.05%	
INDENO(1,2,3-cd)PYRENE	NR	—	NR	0.000764	7.00E-08	0.56	1.47E-06	NR	—	1.54E-06	1.35	<0.01	0.03%	
BENZO(b)FLUORANTHENE	NR	—	NR	0.002086	2.00E-07	0.34	8.90E-07	NR	—	1.09E-06	1.35	<0.01	0.02%	
BENZO(a)ANTHRACENE	NR	—	NR	0.002696	2.50E-07	0.18	4.70E-07	NR	—	7.20E-07	1.35	<0.01	0.01%	
PYRENE	NR	—	NR	0.009142	8.60E-07	0.21	5.50E-07	NR	—	1.41E-06	10.00	<0.01	<0.01%	
BENZO(ghi)PERYLENE	NR	—	NR	0.001698	1.60E-07	0.56	1.47E-06	NR	—	1.63E-06	13.50	<0.01	<0.01%	
FLUORANTHENE	NR	—	NR	0.010412	9.80E-07	0.28	7.40E-07	NR	—	1.72E-06	16.66	<0.01	<0.01%	
CHROMIUM	NR	—	NR	—	12.86	3.39E-05	NR	—	3.39E-05	833.00	<0.01	<0.01%		
PHENANTHRENE	NR	—	NR	0.043094	4.05E-06	0.46	1.20E-06	NR	—	5.25E-06	135.03	<0.01	<0.01%	
CHRYSENE	NR	—	NR	0.002215	2.10E-07	0.10	2.60E-07	NR	—	4.70E-07	13.50	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Red-Tailed Hawks at RFETS

Contribution of ERA Source Areas to Red-Tailed Hawks Risk of Toxic Exposure



Summary of Ecotoxicological Risk to Red-Tailed Hawks in the Soil Dump Areas Source Area at RFETS

Analyte	EXPOSURE POINT						SUMMARY		
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
	UCL ₉₅	Intake	UCL ₉₅	Intake					
BERYLLIUM	IR = 0.098 SUF = 0.028	2.70	0.01	0.70	5.40E-05	0.01	0.01	1.44	
MERCURY	0.30	8.28E-04	0.08	5.95E-06	8.34E-04	0.01	0.13	7.05%	
MAGNESIUM	1292.00	3.55	2356.56	0.18	3.73	79.32	0.05	2.62%	
ALUMINUM	451.74	1.24	8368.17	0.64	1.88	58.82	0.03	1.78%	
THALLIUM	ND	—	0.89	6.85E-05	6.85E-05	0.00	0.03	1.53%	
TIN	77.10	0.21	ND	—	0.21	7.90	0.03	1.49%	
ZINC	85.71	0.24	57.21	4.39E-03	0.24	10.85	0.02	1.23%	
COBALT	ND	—	6.83	5.24E-04	5.24E-04	0.03	0.02	1.13%	
LITHIUM	ND	—	7.90	6.06E-04	6.06E-04	0.03	0.02	1.00%	
STRONTIUM	33.63	0.09	38.68	2.97E-03	0.10	6.78	0.01	0.78%	
VANADIUM	ND	—	25.69	1.97E-03	1.97E-03	0.30	0.01	0.37%	
MANGANESE	15.08	0.04	256.10	0.02	0.06	12.70	<0.01	0.27%	
LEAD	2.51	0.01	25.35	1.94E-03	0.01	1.85	<0.01	0.27%	
BARIUM	11.86	0.03	135.77	0.01	0.04	10.14	<0.01	0.24%	
COPPER	9.48	0.03	17.78	1.36E-03	0.03	16.15	<0.01	0.09%	
CHROMIUM	ND	—	12.07	9.26E-04	9.26E-04	1.06	<0.01	0.05%	
ARSENIC	ND	—	4.82	3.70E-04	3.70E-04	0.89	<0.01	0.02%	
CADMUM	ND	—	3.05	2.34E-04	2.34E-04	1.49	<0.01	0.01%	
AROCLOR-1254	NR	—	0.10	8.01E-06	8.01E-06	0.17	<0.01	<0.01%	
NICKEL	ND	—	10.77	8.27E-04	8.27E-04	70.05	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Red-Tailed Hawks in the B-Ponds Source Area at RFETS

Analyte	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake		Toxicity Reference Value	Hazard Quotient
	UCL ₉₅	Intake	UCL ₉₅	Intake	Total Intake	—	Percent of Total Risk	
SELENIUM	IR = 0.098 SUF = 0.013	53.92	0.07	ND	—	0.07	0.39	0.17
VANADIUM	28.18	0.04	80.61	2.87E-03	0.04	0.30	0.13	20.00%
MAGNESIUM	5898.79	7.52	8678.88	0.31	7.82	79.32	0.10	15.03%
ALUMINUM	2019.91	2.57	48139.56	1.71	4.29	58.82	0.07	11.29%
ZINC	606.87	0.77	112.99	4.02E-03	0.78	10.85	0.07	8.34%
LEAD	78.53	0.10	55.00	1.96E-03	0.10	1.85	0.06	8.20%
MERCURY	0.23	2.99E-04	ND	—	2.99E-04	0.01	0.05	5.19%
BERYLLIUM	ND	—	6.57	2.34E-04	2.34E-04	0.01	0.04	5.15%
THALLIUM	ND	—	3.05	1.08E-04	1.08E-04	2.50E-03	0.04	4.97%
CHROMIUM	32.11	0.04	48.86	1.74E-03	0.04	1.06	0.04	4.61%
STRONTIUM	163.89	0.21	NC	—	0.21	6.78	0.03	3.52%
TIN	117.72	0.15	ND	—	0.15	7.90	0.02	2.17%
COBALT	ND	—	13.25	4.72E-04	4.72E-04	0.03	0.02	2.09%
MANGANESE	84.59	0.11	509.65	0.02	0.13	12.70	0.01	1.13%
COPPER	112.56	0.14	21.78	7.76E-04	0.14	16.15	0.01	1.02%
BARIUM	55.13	0.07	337.48	0.01	0.08	10.14	0.01	0.93%
ARSENIC	ND	—	8.55	3.05E-04	3.05E-04	0.89	<0.01	0.04%
SILVER	16.47	0.02	ND	—	0.02	1105.03	<0.01	<0.01%
NICKEL	ND	—	18.05	6.43E-04	6.43E-04	70.05	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Red-Tailed Hawks in the A-Ponds Source Area at RFETS

RED-TAILED HAWK A-PONDS	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Intake	UCL ₉₅	Intake				
Analyte	IR = 0.098 SUFI = 0.02		IR = 0.00274 SUFI = 0.02					
VANADIUM	26.71	0.05	NC	—	0.05	0.30	0.18	25.76%
MAGNESIUM	5030.43	9.86	NC	—	9.86	79.32	0.12	18.05%
ZINC	646.55	1.27	NC	—	1.27	10.85	0.12	16.97%
LEAD	80.28	0.16	NC	—	0.16	1.85	0.09	12.38%
CHROMIUM	35.03	0.07	NC	—	0.07	1.06	0.06	9.42%
ALUMINUM	925.17	1.81	NC	—	1.81	58.82	0.03	4.48%
TIN	107.61	0.21	NC	—	0.21	7.90	0.03	3.88%
STRONTIUM	85.89	0.17	NC	—	0.17	6.78	0.02	3.60%
COPPER	106.49	0.21	NC	—	0.21	16.15	0.01	1.88%
MANGANESE	77.29	0.15	NC	—	0.15	12.70	0.01	1.73%
BARIUM	57.80	0.11	NC	—	0.11	10.14	0.01	1.62%
NICKEL	54.10	0.11	NC	—	0.11	70.05	<0.01	0.22%
SILVER	14.72	0.03	ND	—	0.03	1105.03	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Red-Tailed Hawks in the East Trenches Source Area at RFETS

Analyte	EXPOSURE POINT						SUMMARY			
	Small Mammals			Surficial Soil			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00274	SUF = 0.061				
ZINC	308.38	1.84	54.00	0.01	1.85		10.85		0.17	32.80%
SELENIUM	4.61	0.03	0.73	1.23E-04	0.03		0.39		0.07	13.53%
LITHIUM	NR	—	13.27	2.22E-03	2.22E-03		0.03		0.07	12.60%
BERYLLIUM	NR	—	1.56	2.60E-04	2.60E-04		0.01		0.05	9.61%
COBALT	NR	—	7.14	1.19E-03	1.19E-03		0.03		0.05	8.84%
ALUMINUM	NR	—	12216.91	2.04	2.04		58.82		0.03	6.67%
LEAD	8.59	0.05	45.99	0.01	0.06		1.85		0.03	6.14%
VANADIUM	NR	—	27.79	4.64E-03	4.64E-03		0.30		0.02	3.02%
CADMIUM	2.55	0.02	1.44	2.40E-04	0.02		1.49		0.01	1.99%
COPPER	17.17	0.10	13.08	2.19E-03	0.10		16.15		0.01	1.25%
MAGNESIUM	NR	—	2431.74	0.41	0.41		79.32		0.01	0.98%
MANGANESE	NR	—	310.49	0.05	0.05		12.70		<0.01	0.78%
BARIUM	NR	—	128.84	0.02	0.02		10.14		<0.01	0.41%
CHROMIUM	ND	—	12.98	2.17E-03	2.17E-03		1.06		<0.01	0.39%
ARSENIC	NR	—	5.50	9.19E-04	9.19E-04		0.89		<0.01	0.20%
BENZO(a)PYRENE	NR	—	0.21	3.51E-05	3.51E-05		0.04		<0.01	0.18%
PHENANTHRENE	NR	—	0.21	3.48E-05	3.48E-05		0.04		<0.01	0.18%
STRONTIUM	NR	—	34.85	0.01	0.01		6.78		<0.01	0.16%
TIN	NR	—	34.19	0.01	0.01		7.90		<0.01	0.14%
FLUORANTHENE	NR	—	0.23	3.83E-05	3.83E-05		0.37		<0.01	0.02%
PYRENE	NR	—	0.22	3.65E-05	3.65E-05		0.37		<0.01	0.02%
BENZO(a)ANTHRACENE	NR	—	0.21	3.53E-05	3.53E-05		0.37		<0.01	0.02%
BENZO(b)FLUORANTHENE	NR	—	0.20	3.32E-05	3.32E-05		0.37		<0.01	0.02%
CHRYSENE	NR	—	0.19	3.19E-05	3.19E-05		0.37		<0.01	0.02%
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	0.22	3.69E-05	3.69E-05		0.58		<0.01	0.01%
NICKEL	NR	—	11.63	1.94E-03	1.94E-03		70.05		<0.01	0.01%
SILVER	ND	—	3.59	5.99E-04	5.99E-04		1105.03		<0.01	<0.01%

HAZARD INDEX 0.52

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the 903 Pad Source Area at RFETS

Analyte	EXPOSURE POINT						SUMMARY			
	Small Mammals		UCL ₉₅		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	IR = 0.998	Intake	UCL ₉₅	Intake	IR = 0.00274	SUF = 0.042				
ZINC	154.35	0.64	72.70	0.01	0.64	10.85	0.06	0.06	17.12%	
LITHIUM	NR	—	13.59	1.56E-03	1.56E-03	0.03	0.05	0.05	13.35%	
THALLIUM	NR	—	0.87	9.96E-05	9.96E-05	2.50E-03	0.04	0.04	11.50%	
COBALT	NR	—	7.67	8.83E-04	8.83E-04	0.03	0.03	0.03	9.84%	
SELENIUM	3.11	0.01	0.68	7.80E-05	0.01	0.39	0.03	0.03	9.47%	
BERYLLIUM	NR	—	1.29	1.48E-04	1.48E-04	0.01	0.03	0.03	8.23%	
ALUMINUM	NR	—	11886.18	1.37	1.37	58.82	0.02	0.02	6.71%	
CHROMIUM	5.03	0.02	26.79	3.08E-03	0.02	1.06	0.02	0.02	6.49%	
LEAD	5.39	0.02	32.37	3.72E-03	0.03	1.85	0.01	0.01	4.05%	
VANADIUM	NR	—	35.68	4.11E-03	4.11E-03	0.30	0.01	0.01	4.01%	
CADMIUM	2.63	0.01	1.29	1.48E-04	0.01	1.49	0.01	0.01	2.12%	
MAGNESIUM	NR	—	3426.35	0.39	0.39	79.32	<0.01	<0.01	1.43%	
COPPER	16.63	0.07	21.82	2.51E-03	0.07	16.15	<0.01	<0.01	1.27%	
MANGANESE	NR	—	318.24	0.04	0.04	12.70	<0.01	<0.01	0.83%	
PHENANTHRENE	NR	—	0.56	6.39E-05	6.39E-05	0.04	<0.01	<0.01	0.50%	
BARIUM	NR	—	143.68	0.02	0.02	10.14	<0.01	<0.01	0.41%	
MERCURY	ND	—	0.08	8.74E-06	8.74E-06	0.01	<0.01	<0.01	0.38%	
BENZO(a)PYRENE	NR	—	0.32	3.69E-05	3.69E-05	0.04	<0.01	<0.01	0.29%	
BENZO(k)FLUORANTHENE	NR	—	0.31	3.58E-05	3.58E-05	0.04	<0.01	<0.01	0.28%	
STRONTIUM	NR	—	43.04	4.95E-03	4.95E-03	6.78	<0.01	<0.01	0.21%	
Di-n-BUTYL PHTHALATE	NR	—	0.35	4.07E-05	4.07E-05	0.06	<0.01	<0.01	0.20%	
ANTHRACENE	NR	—	0.20	2.31E-05	2.31E-05	0.04	<0.01	<0.01	0.18%	
DIBENZO(a,h)ANTHRACENE	NR	—	0.18	2.06E-05	2.06E-05	0.04	<0.01	<0.01	0.16%	
ARSENIC	NR	—	4.00	4.60E-04	4.60E-04	0.89	<0.01	<0.01	0.15%	
TIN	NR	—	33.32	3.83E-03	3.83E-03	7.90	<0.01	<0.01	0.14%	
MOLYBDENUM	NR	—	4.98	5.73E-04	5.73E-04	1.20	<0.01	<0.01	0.14%	
NITRATE/NITRITE	NR	—	3.11	3.57E-04	3.57E-04	0.96	<0.01	<0.01	0.11%	
INDENO(1,2,3-cd)PYRENE	NR	—	0.19	2.16E-05	2.16E-05	0.09	<0.01	<0.01	0.07%	
FLUORANTHENE	NR	—	0.69	7.93E-05	7.93E-05	0.37	<0.01	<0.01	0.06%	
PYRENE	NR	—	0.64	7.41E-05	7.41E-05	0.37	<0.01	<0.01	0.06%	
AROCLOR-1254	NR	—	0.21	2.40E-05	2.40E-05	0.17	<0.01	<0.01	0.04%	
CHRYSENE	NR	—	0.34	3.92E-05	3.92E-05	0.37	<0.01	<0.01	0.03%	
BENZO(b)FLUORANTHENE	NR	—	0.34	3.87E-05	3.87E-05	0.37	<0.01	<0.01	0.03%	
BENZO(a)ANTHRACENE	NR	—	0.33	3.85E-05	3.85E-05	0.37	<0.01	<0.01	0.03%	
BENZO(ghi)PYRENE	NR	—	0.19	2.20E-05	2.20E-05	0.37	<0.01	<0.01	0.02%	
FLUORENE	NR	—	0.19	2.18E-05	2.18E-05	0.37	<0.01	<0.01	0.02%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	0.25	2.86E-05	2.86E-05	0.58	<0.01	<0.01	0.01%	
NICKEL	NR	—	26.99	3.11E-03	3.11E-03	70.05	<0.01	<0.01	0.01%	
ACENAPHTHENE	NR	—	0.19	2.14E-05	2.14E-05	37.22	<0.01	<0.01	<0.01%	

HAZARD INDEX 0.35

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the 881 Hillsides Source Area at RFETS

Analyte	EXPOSURE POINT						SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Intake						
ZINC	IR = 0.098 SUF = 0.034	159.13	0.53	85.55	0.01	0.54	10.85	0.05	17.31%	
SELENIUM	4.35	0.01	0.51	4.76E-05	0.01	0.39	0.04	12.91%		
COBALT	NR	—	8.34	7.77E-04	7.77E-04	0.03	0.03	10.47%		
LITHIUM	NR	—	9.47	8.82E-04	8.82E-04	0.03	0.03	9.11%		
THALLIUM	NR	—	0.66	6.11E-05	6.11E-05	2.50E-03	0.02	8.52%		
ALUMINUM	NR	—	14308.32	1.33	1.33	58.82	0.02	7.91%		
BERYLLIUM	NR	—	1.26	1.17E-04	1.17E-04	0.01	0.02	7.86%		
COPPER	81.05	0.27	35.48	3.31E-03	0.27	16.15	0.02	5.91%		
CADMIUM	6.11	0.02	0.61	5.69E-05	0.02	1.49	0.01	4.77%		
VANADIUM	NR	—	41.86	3.90E-03	3.90E-03	0.30	0.01	4.61%		
LEAD	4.95	0.02	48.00	4.47E-03	0.02	1.85	0.01	3.97%		
MAGNESIUM	NR	—	3418.57	0.32	0.32	79.32	<0.01	1.40%		
CHROMIUM	ND	—	35.00	3.26E-03	3.26E-03	1.06	<0.01	1.08%		
MANGANESE	NR	—	312.55	0.03	0.03	12.70	<0.01	0.80%		
BARIUM	NR	—	179.14	0.02	0.02	10.14	<0.01	0.57%		
PHENANTHRENE	NR	—	0.56	5.21E-05	5.21E-05	0.04	<0.01	0.49%		
STRONTIUM	NR	—	61.65	0.01	0.01	6.78	<0.01	0.30%		
BENZO(a)PYRENE	NR	—	0.31	2.90E-05	2.90E-05	0.04	<0.01	0.27%		
MERCURY	ND	—	0.05	5.02E-06	5.02E-06	0.01	<0.01	0.21%		
BENZO(k)FLUORANTHENE	NR	—	0.30	2.77E-05	2.77E-05	0.04	<0.01	0.26%		
ARSENIC	NR	—	5.38	5.01E-04	5.01E-04	0.89	<0.01	0.20%		
TIN	NR	—	43.09	4.01E-03	4.01E-03	7.90	<0.01	0.18%		
ANTHRACENE	NR	—	0.20	1.89E-05	1.89E-05	0.04	<0.01	0.18%		
DIBENZO(a,h)ANTHRACENE	NR	—	0.19	1.76E-05	1.76E-05	0.04	<0.01	0.17%		
NITRATE/NITRITE	NR	—	2.11	1.97E-04	1.97E-04	0.96	<0.01	0.07%		
INDENO(1,2,3-cd)PYRENE	NR	—	0.20	1.90E-05	1.90E-05	0.09	<0.01	0.07%		
FLUORANTHENE	NR	—	0.76	7.10E-05	7.10E-05	0.37	<0.01	0.07%		
PYRENE	NR	—	0.69	6.45E-05	6.45E-05	0.37	<0.01	0.06%		
MOLYBDENUM	NR	—	1.93	1.79E-04	1.79E-04	1.20	<0.01	0.05%		
AROCLOR-1254	NR	—	0.26	2.40E-05	2.40E-05	0.17	<0.01	0.05%		
CHRYSENE	NR	—	0.36	3.36E-05	3.36E-05	0.37	<0.01	0.03%		
BENZO(a)ANTHRACENE	NR	—	0.33	3.05E-05	3.05E-05	0.37	<0.01	0.03%		
BENZO(b)FLUORANTHENE	NR	—	0.31	2.92E-05	2.92E-05	0.37	<0.01	0.03%		
BENZO(g,h)PYRENE	NR	—	0.21	1.91E-05	1.91E-05	0.37	<0.01	0.02%		
FLUORENE	NR	—	0.19	1.80E-05	1.80E-05	0.37	<0.01	0.02%		
NICKEL	NR	—	29.86	2.78E-03	2.78E-03	70.95	<0.01	0.01%		
ACENAPHTHENE	NR	—	0.19	1.82E-05	1.82E-05	37.22	<0.01	<0.01%		
NAPHTHALENE	NR	—	0.19	1.81E-05	1.81E-05	37.22	<0.01	<0.01%		

HAZARD INDEX 0.29

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the Ash Pits Source Area at RFETS

ANALYTE	EXPOSURE POINT			SUMMARY			
	SMALL MAMMALS		SUPERFICIAL SOIL	TOTAL INTAKE	REFERENCE VALUE	HAZARD QUOTIENT	PERCENT OF TOTAL RISK
	UCI ₉₅	INTAKE	UCI ₉₅				
ALUMINUM	413.42	1.17	13038.84	1.04	2.21	58.82	0.04
MAGNESIUM	776.81	2.21	2929.96	0.23	2.44	79.32	0.03
THALLIUM	ND	—	0.91	7.27E-05	2.50E-03	0.03	13.03%
COBALT	ND	—	8.40	6.68E-04	0.03	0.03	11.56%
LITHIUM	ND	—	10.38	8.25E-04	0.03	0.02	10.94%
ZINC	78.51	0.22	69.63	0.01	0.23	10.85	0.02
BERYLLIUM	ND	—	0.94	7.47E-05	0.01	0.01	6.44%
VANADIUM	ND	—	36.21	2.88E-03	0.30	0.01	4.37%
STRONTIUM	20.61	0.06	38.77	3.08E-03	0.06	6.78	0.01
LEAD	2.69	0.01	33.78	2.68E-03	0.01	1.85	0.01
MANGANESE	11.94	0.03	337.52	0.03	0.06	12.70	<0.01
BARIUM	9.86	0.03	143.89	0.01	0.04	10.14	<0.01
COPPER	21.42	0.06	16.94	1.35E-03	0.06	16.15	<0.01
CHROMIUM	ND	—	15.96	1.27E-03	1.27E-03	1.06	<0.01
MERCURY	ND	—	0.08	6.17E-06	0.01	<0.01	0.42%
ARSENIC	ND	—	5.72	4.54E-04	4.54E-04	0.89	<0.01
TIN	ND	—	16.66	1.32E-03	1.32E-03	7.90	<0.01
SELENIUM	ND	—	0.41	3.26E-05	3.26E-05	0.39	<0.01
CADMIUM	ND	—	1.35	1.07E-04	1.07E-04	1.49	<0.01
MOLYBDENUM	ND	—	0.93	7.37E-05	7.37E-05	1.20	<0.01
NICKEL	ND	—	13.58	1.08E-03	1.08E-03	70.05	<0.01
SILVER	ND	—	1.81	1.44E-04	1.44E-04	1105.03	<0.01

HAZARD INDEX 0.22

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the OU7 Downgradient Areas Source Area at RFETS

RED-TAILED HAWK OUT DOWNGRADIENT AREAS	EXPOSURE POINT						SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Intake						
VANADIUM	IR = 0.098 SUF = 0.004	31.98	0.01	NR	—	0.01	0.30	0.04	19.12%	
ZINC	938.96	0.37	NR	—	0.37	10.85	0.03	0.03	15.28%	
SELENIUM	33.86	0.01	NR	—	0.01	0.39	0.03	0.03	15.21%	
MAGNESIUM	5812.75	2.28	NR	—	2.28	79.32	0.03	0.03	12.93%	
MERCURY	0.36	0.00	NR	—	1.42E-04	0.01	0.02	0.02	9.67%	
LEAD	72.19	0.03	NR	—	0.03	1.85	0.02	0.02	6.90%	
CHROMIUM	37.27	0.01	NR	—	0.01	1.06	0.01	0.01	6.22%	
STRONTIUM	147.72	0.06	NR	—	0.06	6.78	0.01	0.01	3.84%	
CADMIUM	23.67	0.01	NR	—	0.01	1.49	0.01	0.01	2.80%	
ALUMINUM	798.32	0.31	NR	—	0.31	58.82	0.01	0.01	2.40%	
TIN	66.89	0.03	NR	—	0.03	7.90	<0.01	<0.01	1.49%	
COPPER	135.22	0.05	NR	—	0.05	16.15	<0.01	<0.01	1.48%	
BARIUM	84.54	0.03	NR	—	0.03	10.14	<0.01	<0.01	1.47%	
MANGANESE	81.47	0.03	NR	—	0.03	12.70	<0.01	<0.01	1.13%	
NITRATE/NITRITE	NR	—	10.78	1.18E-04	1.18E-04	0.96	<0.01	<0.01	0.56%	
SILVER	30.35	0.01	NR	—	0.01	1105.03	<0.01	<0.01	<0.01%	

HAZARD INDEX 0.22

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the Old Landfill Source Area at RFETS

RED-TAILED HAWK OLD LANDFILL	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake		Toxicity	Hazard Quotient
	UCL ₉₅	Intake	UCL ₉₅	Intake	Intake	Reference Value		Percent of Total Risk
Analyte	IR = 0.098 SUF = 0.021		IR = 0.00274 SUF = 0.021					
MAGNESIUM	967.47	1.99	2298.53	0.13	2.12	79.32	0.03	12.79%
ALUMINUM	431.43	0.89	11074.66	0.64	1.53	58.82	0.03	12.39%
ZINC	130.10	0.27	66.57	3.83E-03	0.27	10.85	0.03	11.96%
THALLIUM	ND	—	0.91	5.23E-05	2.50E-03	0.02	9.99%	
COBALT	ND	—	8.35	4.80E-04	4.80E-04	0.03	0.02	8.86%
PHENANTHRENE	NR	—	9.64	5.55E-04	5.55E-04	0.04	0.01	7.14%
LITHIUM	ND	—	8.00	4.61E-04	4.61E-04	0.03	0.01	6.51%
BERYLLIUM	ND	—	0.88	5.07E-05	5.07E-05	0.01	0.01	4.66%
STRONTIUM	29.98	0.06	30.81	1.77E-03	0.06	6.78	0.01	4.47%
VANADIUM	ND	—	30.43	1.75E-03	1.75E-03	0.30	0.01	2.83%
LEAD	4.36	0.01	28.70	1.65E-03	0.01	1.85	0.01	2.75%
ANTHRACENE	NR	—	2.82	1.62E-04	1.62E-04	0.04	<0.01	2.08%
COPPER	31.63	0.07	37.70	2.17E-03	0.07	16.15	<0.01	1.99%
BENZO(a)PYRENE	NR	—	2.64	1.52E-04	1.52E-04	0.04	<0.01	1.95%
BARIUM	10.07	0.02	115.59	0.01	0.03	10.14	<0.01	1.29%
BENZO(k)FLUORANTHENE	NR	—	1.69	9.75E-05	9.75E-05	0.04	<0.01	1.25%
MANGANESE	8.23	0.02	277.66	0.02	0.03	12.70	<0.01	1.24%
INDENO(1,2,3-cd)PYRENE	NR	—	2.57	1.48E-04	1.48E-04	0.09	<0.01	0.76%
FLUORANTHENE	NR	—	8.27	4.76E-04	4.76E-04	0.37	<0.01	0.61%
4,4'-DDT	NR	—	0.01	4.90E-07	4.90E-07	4.00E-04	<0.01	0.59%
DIBENZO(a,h)ANTHRACENE	NR	—	0.76	4.36E-05	4.36E-05	0.04	<0.01	0.56%
PYRENE	NR	—	7.09	4.08E-04	4.08E-04	0.37	<0.01	0.52%
MERCURY	ND	—	0.12	7.12E-06	7.12E-06	0.01	<0.01	0.52%
CHROMIUM	ND	—	13.09	7.53E-04	7.53E-04	1.06	<0.01	0.34%
NICKEL	22.57	0.05	14.94	8.60E-04	0.05	70.05	<0.01	0.32%
BENZO(b)FLUORANTHENE	NR	—	3.18	1.83E-04	1.83E-04	0.37	<0.01	0.24%
CHRYSENE	NR	—	2.99	1.72E-04	1.72E-04	0.37	<0.01	0.22%
BENZO(a)ANTHRACENE	NR	—	2.85	1.64E-04	1.64E-04	0.37	<0.01	0.21%
ARSENIC	ND	—	5.70	3.28E-04	3.28E-04	0.89	<0.01	0.18%
FLUORENE	NR	—	2.36	1.36E-04	1.36E-04	0.37	<0.01	0.18%
MOLYBDENUM	ND	—	7.35	4.23E-04	4.23E-04	1.20	<0.01	0.17%
DI-n-BUTYL PHTHALATE	NR	—	0.31	1.80E-05	1.80E-05	0.06	<0.01	0.15%
ACROCLOR-1254	NR	—	0.57	3.29E-05	3.29E-05	0.17	<0.01	0.09%
BENZO(ghi)PERYLENE	NR	—	0.92	5.31E-05	5.31E-05	0.37	<0.01	0.07%
TIN	ND	—	9.71	5.59E-04	5.59E-04	7.90	<0.01	0.03%
HEPTACHLOR EPOXIDE	NR	—	4.30E-03	2.50E-07	2.50E-07	3.68E-03	<0.01	0.03%
SELENIUM	ND	—	0.46	2.64E-05	2.64E-05	0.39	<0.01	0.03%
CADMIUM	ND	—	0.88	5.07E-05	5.07E-05	1.49	<0.01	0.02%
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	0.30	1.75E-05	1.75E-05	0.58	<0.01	0.01%
DIEDRIN	NR	—	0.01	5.30E-07	5.30E-07	0.06	<0.01	<0.01%
ALDRIN	NR	—	4.66E-03	2.70E-07	2.70E-07	0.06	<0.01	<0.01%
ACENAPHTHENE	NR	—	2.64	1.52E-04	1.52E-04	37.22	<0.01	<0.01%
NAPHTHALENE	NR	—	2.50	1.44E-04	1.44E-04	37.22	<0.01	<0.01%

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the Old Landfill Source Area at RFETS

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RED-TAILED HAWK OLD LANDFILL	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity	Hazard Quotient	Percent of Total Risk
Analyte	UCI ₉₅	Intake	UCI ₉₅	Intake	Intake	Reference Value		
2-METHYLNAPHTHALENE	NR	—	0.94	5.43E-05	5.43E-05	37.22	<0.01	<0.01%
Di-n-OCTYL PHTHALATE	NR	—	0.33	1.92E-05	1.92E-05	47.45	<0.01	<0.01%
SILVER	ND	—	7.18	4.13E-04	4.13E-04	1105.03	<0.01	<0.01%
BUTYL BENZYL PHTHALATE	NR	—	0.34	1.95E-05	1.95E-05	108.61	<0.01	<0.01%
HAZARD INDEX				0.21				

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the C-Ponds Source Area at RFETS

RED-TAILED HAWK C-PONDS	EXPOSURE POINT						SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Intake	UCL ₉₅	Intake						
Analyte	IR = 0.098 SUF = 0.02		IR = 0.00274 SUF = 0.02							
ZINC	331.68	0.65	NC	—	0.65	10.85	0.06	48.51%		
SELENIUM	7.96	0.02	NC	—	0.02	0.39	0.04	32.15%		
CHROMIUM	5.36	0.01	NC	—	0.01	1.06	0.01	8.04%		
LEAD	6.57	0.01	NC	—	0.01	1.85	0.01	5.65%		
CADMIUM	3.37	0.01	ND	—	0.01	1.49	<0.01	3.58%		
COPPER	21.04	0.04	NC	—	0.04	16.15	<0.01	2.07%		
									HAZARD INDEX	0.12

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the OU6 Burial Trenches Source Area at RFETS

RED-TAILED HAWK OU6 BURIAL TRENCHES		EXPOSURE POINT			SUMMARY				
Analyte	IR = 0.098 SUF = 0.002	Small Mammals		Surficial Soil	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
		UCL ₉₅	Intake	UCL ₉₅					
VANADIUM	31.85	0.01	NR	—	0.01	0.30	0.02	24.02%	
ZINC	1148.37	0.23	NR	—	0.23	10.85	0.02	23.57%	
MAGNESIUM	7324.19	1.44	NR	—	1.44	79.32	0.02	20.56%	
CHROMIUM	30.22	0.01	NR	—	0.01	1.06	0.01	6.36%	
ALUMINUM	1375.78	0.27	NR	—	0.27	58.82	<0.01	5.21%	
STRONTIUM	130.26	0.03	NR	—	0.03	6.78	<0.01	4.27%	
LEAD	32.34	0.01	NR	—	0.01	1.85	<0.01	3.90%	
TIN	130.69	0.03	NR	—	0.03	7.90	<0.01	3.68%	
SELENIUM	4.58	8.97E-04	NR	—	8.97E-04	0.39	<0.01	2.59%	
MANGANESE	131.94	0.03	NR	—	0.03	12.70	<0.01	2.31%	
COPPER	129.61	0.03	NR	—	0.03	16.15	<0.01	1.79%	
BARIUM	78.93	0.02	NR	—	0.02	10.14	<0.01	1.73%	
SILVER	6.28	1.23E-03	NR	—	1.23E-03	1105.03	<0.01	<0.01%	
						HAZARD INDEX	0.09		

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Summary of Ecotoxicological Risk to Red-Tailed Hawks in the North Spray Field Source Area at RFETS

Analyte	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
RED-TAILED HAWK NORTH SPRAY FIELD	UCL ₉₅	Intake	UCL ₉₅	Intake				
COBALT	IR = NR SUF = 0.007	NR	—	9.70	0.00	0.00	0.03	0.01
THALLIUM	NR	—	0.93	0.00	0.00	0.00	0.01	24.69%
ALUMINUM	NR	—	11487.90	0.22	0.22	58.82	<0.01	12.98%
LITHIUM	NR	—	6.56	0.00	0.00	0.03	<0.01	12.91%
BERYLLIUM	NR	—	0.63	0.00	• 0.00	0.01	<0.01	8.09%
VANADIUM	NR	—	33.08	0.00	• 0.00	0.30	<0.01	7.45%
MAGNESIUM	NR	—	2325.99	0.04	0.04	79.32	<0.01	1.98%
MANGANESE	NR	—	319.60	0.01	0.01	12.70	<0.01	1.67%
LEAD	NR	—	40.40	0.00	0.00	1.85	<0.01	1.45%
BARIUM	NR	—	169.61	0.00	0.00	10.14	<0.01	1.11%
CHROMIUM	NR	—	12.82	0.00	0.00	1.06	<0.01	0.81%
MERCURY	NR	—	0.07	0.00	0.00	0.01	<0.01	0.66%
ARSENIC	NR	—	6.62	0.00	0.00	0.89	<0.01	0.50%
STRONTIUM	NR	—	31.03	0.00	0.00	6.78	<0.01	0.30%
ZINC	NR	—	48.93	0.00	0.00	10.85	<0.01	0.30%
SELENIUM	NR	—	0.58	0.00	0.00	0.39	<0.01	0.10%
COPPER	NR	—	14.01	0.00	0.00	16.15	<0.01	0.08%
CADMUM	NR	—	0.99	0.00	0.00	1.49	<0.01	0.04%
NICKEL	NR	—	15.06	0.00	0.00	70.05	<0.01	0.01%

HAZARD INDEX 0.03

Summary of Ecotoxicological Risk to Red-Tailed Hawks in the Mound Area Source Area at RFETS

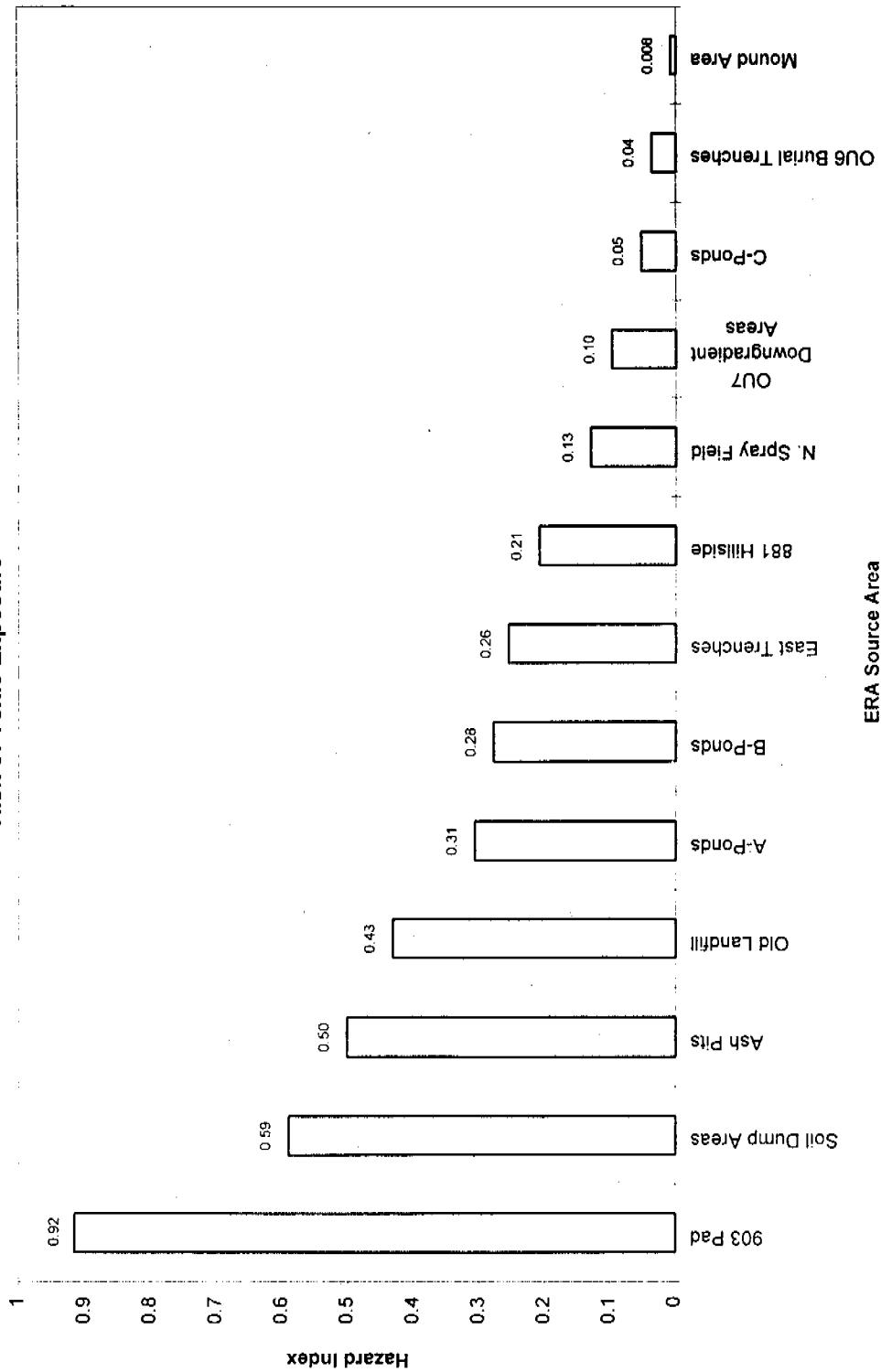
RED-TAILED HAWK MOUND AREA	EXPOSURE POINT				SUMMARY			
	Small Mammals		Surficial Soil		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte ¹	UCI ₉₅ IR = 0.098 SUF = 0.003	Intake	UCI ₉₅ IR = 0.00274 SUF = 0.003	Intake	Total Intake	Reference Value	Quotient	
THALLIUM	NR	—	2.33	1.91E-05	1.91E-05	2.50E-03	0.01	39.61%
COBALT	NR	—	10.19	8.37E-05	0.03	<0.01	16.73%	
LITHIUM	NR	—	11.19	9.20E-05	0.03	<0.01	14.08%	
ALUMINUM	NR	—	15228.01	0.13	0.13	58.82	<0.01	11.01%
VANADIUM	NR	—	50.76	4.17E-04	4.17E-04	0.30	<0.01	7.31%
LEAD	3.2	9.41E-04	19.45	1.60E-04	1.10E-03	1.85	<0.01	3.09%
MAGNESIUM	NR	—	3527.10	0.03	0.03	79.32	<0.01	1.89%
MANGANESE	NR	—	338.31	2.78E-03	2.78E-03	12.70	<0.01	1.13%
STRONTIUM	NR	—	129.27	1.06E-03	1.06E-03	6.78	<0.01	0.81%
AROCLOR-1254	NR	—	3.04	2.50E-05	2.50E-05	0.17	<0.01	0.75%
BARIUM	NR	—	160.34	1.32E-03	1.32E-03	10.14	<0.01	0.67%
PHENANTHRENE	NR	—	0.46	3.75E-06	3.75E-06	0.04	<0.01	0.52%
CHROMIUM	NR	—	12.86	1.06E-04	1.06E-04	1.06	<0.01	0.52%
ARSENIC	NR	—	9.35	7.69E-05	7.69E-05	0.89	<0.01	0.45%
AROCLOR-1260	NR	—	1.78	1.46E-05	1.46E-05	0.17	<0.01	0.44%
ZINC	NR	—	66.49	5.47E-04	5.47E-04	10.85	<0.01	0.26%
INDENO(1,2,3-cd)PYRENE	NR	—	0.56	4.58E-06	4.58E-06	0.09	<0.01	0.25%
BENZO(a)PYRENE	NR	—	0.17	1.40E-06	1.40E-06	0.04	<0.01	0.19%
BENZO(g,h)PYRENE	NR	—	0.56	4.58E-06	4.58E-06	0.37	<0.01	0.06%
COPPE?	NR	—	15.23	1.25E-04	1.25E-04	16.15	<0.01	0.04%
BIS(2-ETHYLHEXYL)PHTHALATE	NR	—	0.54	4.43E-06	4.43E-06	0.58	<0.01	0.04%
BENZO(b)FLUORANTHENE	NR	—	0.34	2.78E-06	2.78E-06	0.37	<0.01	0.04%
FLUORANTHENE	NR	—	0.28	2.30E-06	2.30E-06	0.37	<0.01	0.03%
PYRENE	NR	—	0.21	1.70E-06	1.70E-06	0.37	<0.01	0.02%
BENZO(a)ANTHRACENE	NR	—	0.18	1.47E-06	1.47E-06	0.37	<0.01	0.02%
CHRYSENE	NR	—	0.10	8.20E-07	8.20E-07	0.37	<0.01	0.01%
NICKEL	NR	—	11.67	9.59E-05	9.59E-05	70.05	<0.01	0.01%

HAZARD INDEX 0.02

¹ Lead concentration in small mammals is based on the soil:small mammal ratio in the East Trenches source area

Summary of Ecotoxicological Risk to Mule Deer at RFETS

Contribution of ERA Source Areas to Mule Deer Risk of Toxic Exposure



Summary of Ecotoxicological Risk to Mule Deer in the 903 Pad Source Area at RFETS

MULE DEER 903 PAD	EXPOSURE POINT						SUMMARY					
	Vegetation			Surficial Soil			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.0044	IR = 0.004	SUF = 0.066	IR = 0.004	
VANADIUM	17.31	0.04	35.68	1.55E-03	0.03	6.96E-06	0.04	0.37	0.11	11.52%		
CADMIUM	2.11	4.59E-03	1.29	5.62E-05	2.30E-03	6.10E-07	4.65E-03	0.05	0.10	10.96%		
SELENIUM	2.29	4.98E-03	0.68	2.95E-05	0.01	2.15E-06	0.01	0.05	0.09	10.29%		
MERCURY	0.10	2.13E-04	0.08	3.31E-06	1.14E-04	3.00E-08	2.17E-04	0.00	0.09	9.85%		
ALUMINUM	297.17	0.65	11886.18	0.52	5.48	1.45E-03	1.17	13.14	0.09	9.65%		
MAGNESIUM	1426.04	3.11	3426.35	0.15	39.93	0.01	3.27	44.06	0.07	8.05%		
BARIUM	59.79	0.13	143.68	0.01	0.26	6.90E-05	0.14	2.00	0.07	7.46%		
LITHIUM	49.67	0.11	13.59	5.92E-04	0.07	1.87E-05	0.11	1.63	0.07	7.27%		
COBALT	25.37	0.06	7.67	3.34E-04	0.01	3.14E-06	0.06	0.86	0.06	7.08%		
ANTIMONY	ND	—	12.20	5.32E-04	0.02	5.22E-06	5.37E-04	0.01	0.06	6.29%		
TIN	64.48	0.14	33.32	1.45E-03	0.05	1.39E-05	0.14	4.28	0.03	3.62%		
MANGANESE	170.00	0.37	318.24	0.01	0.31	8.23E-05	0.38	15.31	0.03	2.74%		
MOLYBDENUM	87.52	0.19	4.98	2.17E-04	0.02	6.38E-06	0.19	11.11	0.02	1.87%		
COPPER	10.42	0.02	21.82	9.50E-04	0.02	6.35E-06	0.02	2.88	0.01	0.90%		
NICKEL	12.60	0.03	26.99	1.18E-03	0.01	3.74E-06	0.03	6.96	<0.51	0.45%		
LEAD	1.79	3.90E-03	32.37	1.41E-03	0.01	1.76E-06	0.01	1.39	<0.01	0.42%		
SILVER	5.59	0.01	ND	—	4.50E-03	1.19E-06	0.01	3.81	<0.01	0.33%		
ZINC	29.15	0.06	72.70	3.17E-03	0.23	6.00E-05	0.07	27.83	<0.01	0.28%		
STRONTIUM	46.85	0.10	43.04	1.87E-03	1.03	2.72E-04	0.10	45.74	<0.01	0.23%		
ARSENIC	ND	—	4.00	1.74E-04	0.01	1.46E-06	1.76E-04	0.11	<0.01	0.11%		
ACROCLOR-1248	NR	2.41E-03	5.24E-06	0.21	9.20E-06	ND	—	1.44E-05	0.01	<0.01	0.16%	
ACROCLOR-1254	NR	1.47E-03	3.20E-06	0.21	9.08E-06	1.88E-03	5.00E-07	1.28E-05	0.01	<0.01	0.15%	
BERYLLIUM	ND	—	1.29	5.61E-05	1.26E-03	3.30E-07	5.64E-05	0.11	<0.01	0.05%		
THALLIUM	ND	—	0.87	3.77E-05	ND	—	3.77E-05	0.11	<0.01	0.04%		
BENZO(a)PYRENE	NR	4.23E-03	9.20E-06	0.32	1.40E-05	ND	—	2.32E-05	0.08	<0.01	0.03%	
NITRATE/NITRITE	NR	—	3.11	1.35E-04	0.79	2.09E-04	3.45E-04	2.25	<0.01	0.02%		
DIBENZO(a,h)ANTHRACENE	NR	1.46E-03	3.19E-06	0.18	7.80E-06	ND	—	1.10E-05	0.08	<0.01	0.02%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	0.02	4.30E-05	0.25	1.08E-05	ND	—	5.38E-05	1.42	<0.01	<0.01%	
BENZO(a)ANTHRACENE	NR	0.01	1.10E-05	0.33	1.46E-05	ND	—	2.55E-05	0.77	<0.01	<0.01%	
CHROMIUM	5.51	0.01	26.79	1.17E-03	0.01	3.00E-06	0.01	476.07	<0.01	<0.01%		
BENZO(b)FLUORANTHENE	NR	2.08E-03	4.52E-06	0.34	1.47E-05	ND	—	1.92E-05	0.77	<0.01	<0.01%	
BENZO(k)FLUORANTHENE	NR	1.32E-03	2.88E-06	0.31	1.35E-05	ND	—	1.64E-05	0.77	<0.01	<0.01%	
PYRENE	NR	0.03	6.20E-05	0.64	2.80E-05	ND	—	9.01E-05	5.67	<0.01	<0.01%	
INDENO(1,2,3-cd)PYRENE	NR	2.58E-04	5.60E-07	0.19	8.19E-06	ND	—	8.75E-06	0.77	<0.01	<0.01%	
FLUORANTHENE	NR	0.03	5.59E-05	0.69	3.00E-05	ND	—	8.59E-05	9.45	<0.01	<0.01%	
FLUORENE	NR	0.03	6.14E-05	0.19	8.27E-06	ND	—	6.97E-05	9.45	<0.01	<0.01%	
ACENAPHTHENE	NR	0.03	6.44E-05	0.19	8.11E-06	ND	—	7.25E-05	13.23	<0.01	<0.01%	
CHRYSENE	NR	0.01	1.64E-05	0.34	1.48E-05	ND	—	3.13E-05	7.73	<0.01	<0.01%	
1,2-DICHLOROETHENE	NR	NR	—	NR	—	0.01	3.02E-06	3.02E-06	1.29	<0.01	<0.01%	
Di-n-BUTYL PHTHALATE	NR	0.03	6.80E-05	0.35	1.54E-05	0.01	1.59E-06	8.50E-05	42.53	<0.01	<0.01%	
ACETONE	NR	NR	—	NR	—	0.01	3.47E-06	3.47E-06	1.74	<0.01	<0.01%	
PHENANTHRENE	NR	0.05	1.14E-04	0.56	2.42E-05	ND	—	1.39E-04	77.28	<0.01	<0.01%	
TETRACHLOROETHENE	NR	NR	—	NR	—	0.01	1.66E-06	1.66E-06	1.06	<0.01	<0.01%	

Summary of Ecotoxicological Risk to Mule Deer in the 903 Pad Source Area at RFETS

MULE DEER 903 PAD	EXPOSURE POINT						SUMMARY						
	Vegetation			Surficial Soil			Surface Water			Total	Toxicity	Hazard	Percent of Total Risk
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00044 SUF = 0.099	IR = 0.004 SUF = 0.066	Reference Value	Quotient	Quotient	Percent of Total Risk
Analyte	IR = 0.022 SUF = 0.099	NR	5.83E-04	1.27E-06	0.19	8.32E-06	ND	—	9.59E-06	7.73	<0.01	<0.01%	
BENZO(ghi)PERYLENE	NR	NR	—	NR	—	NR	0.01	2.84E-06	2.84E-06	2.61	<0.01	<0.01%	
CHLOROFORM	NR	NR	—	NR	—	NR	3.71E-03	9.80E-07	9.80E-07	1.02	<0.01	<0.01%	
METHYLENE CHLORIDE	NR	NR	—	NR	—	NR	5.34E-03	1.41E-06	1.41E-06	1.77	<0.01	<0.01%	
BENZYL ALCOHOL	NR	ND	—	ND	—	ND	—	5.41E-05	5.41E-05	75.59	<0.01	<0.01%	
ANTHRACENE	NR	0.02	4.53E-05	0.20	8.74E-06	ND	—	2.84E-03	7.50E-07	7.50E-07	—	—	
CARBON DISULFIDE	NR	NR	—	NR	—	NR	—	—	—	1.88	<0.01	<0.01%	
TRICHLOROETHENE	NR	NR	—	NR	—	NR	0.01	3.23E-06	3.23E-06	11.10	<0.01	<0.01%	
HAZARD INDEX												0.92	

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Summary of Ecotoxicological Risk to Mule Deer in the Soil Dump Areas Source Area at RFETS

MULE DEER SOIL DUMP AREAS	EXPOSURE POINT						SUMMARY				
	Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	IR = I					
Analyte	IR = 0.022 SUF = 0.065	IR = 0.00044 SUF = 0.065	IR = 0.00044 SUF = 1	IR = 1 SUF = 1	IR = 1 SUF = 1	IR = 1 SUF = 1	IR = 1 SUF = 1				
SELENIUM	6.62	0.01	ND	—	NR	—	0.01	0.05	0.18	30.10%	
VANADIUM	26.61	0.04	25.69	7.35E-04	NR	—	0.04	0.37	0.10	17.64%	
CADMIUM	2.47	3.53E-03	3.05	8.73E-05	NR	—	3.62E-03	0.05	0.08	13.22%	
MERCURY	0.10	1.44E-04	0.08	2.22E-06	NR	—	1.46E-04	2.40E-03	0.06	10.30%	
MAGNESIUM	1537.93	2.20	2356.56	0.07	NR	—	2.27	44.06	0.05	8.70%	
ALUMINUM	142.00	0.20	8368.17	0.24	NR	—	0.44	13.14	0.03	5.69%	
LITHIUM	32.04	0.05	7.90	2.26E-04	NR	—	0.05	1.63	0.03	4.77%	
BARIUM	21.08	0.03	135.77	3.88E-03	NR	—	0.03	2.00	0.02	2.88%	
TIN	38.48	0.06	ND	—	NR	—	0.06	4.28	0.01	2.17%	
MOLYBDENUM	38.99	0.06	ND	—	NR	—	0.06	11.11	0.01	0.85%	
MANGANESE	48.49	0.07	256.10	0.01	NR	—	0.08	15.31	0.01	0.85%	
NICKEL	20.48	0.03	10.77	3.08E-04	NR	—	0.03	6.96	<0.01	0.72%	
COPPER	8.06	0.01	17.78	5.09E-04	NR	—	0.01	2.88	<0.01	0.71%	
STRONTIUM	80.64	0.12	38.68	1.11E-03	NR	—	0.12	45.74	<0.01	0.43%	
LEAD	1.22	1.75E-03	25.35	7.25E-04	NR	—	2.48E-03	1.39	<0.01	0.30%	
ZINC	32.11	0.05	57.21	1.64E-03	NR	—	0.05	27.83	<0.01	0.29%	
ARSENIC	ND	—	4.82	1.38E-04	NR	—	1.38E-04	0.11	<0.01	0.20%	
AROCLO-1254	NR	7.36E-04	1.05E-06	0.10	2.98E-06	NR	—	4.03E-06	0.01	<0.01	0.07%
THALLIUM	ND	—	0.89	2.55E-05	NR	—	2.55E-05	0.11	<0.01	0.04%	
COBALT	ND	—	6.83	1.95E-04	NR	—	1.95E-04	0.86	<0.01	0.04%	
BERYLLIUM	ND	—	0.70	2.02E-05	NR	—	2.02E-05	0.11	<0.01	0.03%	
CHROMIUM	ND	—	12.07	3.45E-04	NR	—	3.45E-04	- 476.07	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Mule Deer in the Ash Pits Source Area at RFETS

MULE DEER ASH PITS	EXPOSURE POINT										SUMMARY				
	Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	IR = 0.00044	IR = 0.0067	IR = 0.004						
Analyte	IR = 0.022	SUF = 0.067	IR = 0.00044	SUF = 0.067	IR = 0.004	SUF = 0.063	IR = 0.00044	SUF = 0.067	IR = 0.004	SUF = 0.063	IR = 0.00044	SUF = 0.067	IR = 0.004	SUF = 0.063	IR = 0.00044
CADMIUM	2.18	—	3.21E-03	1.35	3.98E-05	1.49E-03	3.80E-07	3.25E-03	0.05	0.07	0.07	0.07	0.07	0.07	13.96%
VANADIUM	15.94	0.02	36.21	1.07E-03	0.01	2.17E-06	0.02	—	0.37	0.07	0.07	0.07	0.07	0.07	13.13%
MERCURY	0.10	1.44E-04	0.08	2.29E-06	1.10E-04	3.00E-08	1.46E-04	2.40E-03	0.06	0.06	0.06	0.06	0.06	0.06	12.08%
ARSENIC	4.47	0.01	5.72	1.68E-04	2.09E-03	5.30E-07	0.01	0.11	0.11	0.06	0.06	0.06	0.06	0.06	0.06
ALUMINUM	264.44	0.39	13038.84	0.38	0.86	2.15E-04	0.77	13.14	0.06	0.06	0.06	0.06	0.06	0.06	11.71%
BARIUM	66.75	0.10	143.89	4.24E-03	0.07	1.78E-05	0.10	—	2.00	0.05	0.05	0.05	0.05	0.05	10.21%
MAGNESIUM	1466.88	2.16	2929.96	0.09	6.86	1.73E-03	2.25	44.06	0.05	0.05	0.05	0.05	0.05	0.05	10.15%
BERYLLIUM	2.53	3.73E-03	0.94	2.77E-05	1.37E-03	3.40E-07	3.76E-03	0.11	0.03	0.03	0.03	0.03	0.03	0.03	6.52%
TIN	92.82	0.14	16.66	4.91E-04	0.02	5.46E-06	0.14	4.28	0.03	0.03	0.03	0.03	0.03	0.03	6.37%
MANGANESE	42.73	0.06	337.52	0.01	0.15	3.73E-05	0.07	—	15.31	<0.01	<0.01	<0.01	<0.01	<0.01	0.95%
COPPER	7.60	0.01	16.94	4.99E-04	0.01	1.42E-06	0.01	—	2.88	<0.01	<0.01	<0.01	<0.01	<0.01	0.81%
NICKEL	14.80	0.02	13.58	4.00E-04	0.01	2.20E-06	0.02	—	6.96	<0.01	<0.01	<0.01	<0.01	<0.01	0.63%
LEAD	1.58	2.33E-03	33.78	9.96E-04	3.78E-03	9.50E-07	3.33E-03	1.39	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.48%
SILVER	5.09	0.01	1.81	5.33E-05	3.22E-03	8.10E-07	0.01	—	3.81	<0.01	<0.01	<0.01	<0.01	<0.01	0.39%
ZINC	29.22	0.04	69.63	2.05E-03	0.02	4.51E-06	0.05	—	27.83	<0.01	<0.01	<0.01	<0.01	<0.01	0.32%
STRONTIUM	45.07	0.07	38.77	1.14E-03	0.25	6.22E-05	0.07	—	45.74	<0.01	<0.01	<0.01	<0.01	<0.01	0.29%
ANTIMONY	ND	—	ND	—	0.02	3.87E-06	3.87E-06	0.01	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.08%
COBALT	ND	—	8.40	2.48E-04	0.01	1.85E-06	2.50E-04	0.86	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.06%
THALLIUM	ND	—	0.91	2.70E-05	ND	—	2.70E-05	0.11	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.05%
SELENIUM	ND	—	0.41	1.21E-05	1.98E-03	5.00E-07	1.26E-05	0.05	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.05%
LITHIUM	ND	—	10.38	3.06E-04	1.49E-02	3.76E-06	3.10E-04	1.63	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.04%
CHROMIUM	4.65	0.01	15.96	4.70E-04	3.90E-03	9.80E-07	0.01	—	476.07	<0.01	<0.01	<0.01	<0.01	<0.01	0.06%
NITRATE/NITRITE	NR	—	NR	—	0.09	2.23E-05	2.23E-05	2.25	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.05%
MOLYBDENUM	ND	—	0.93	2.73E-05	0.02	4.97E-06	3.23E-05	11.11	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.05%
BIS(2-ETHYLHEXYL)PHTHALATE	NR	NR	NR	—	0.01	3.33E-06	3.33E-06	1.42	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.04%
ACETONE	NR	NR	NR	—	0.01	2.26E-06	2.26E-06	1.74	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.03%
METHYLENE CHLORIDE	NR	NR	NR	—	4.74E-03	1.19E-06	1.19E-06	1.02	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.03%
CARBON DISULFIDE	NR	NR	NR	—	2.74E-03	6.90E-07	6.90E-07	1.88	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.03%
1,2-DICHLOROETHANE	NR	NR	NR	—	3.07E-03	7.70E-07	7.70E-07	4.07	—	<0.01	<0.01	<0.01	<0.01	<0.01	0.03%

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Summary of Ecotoxicological Risk to Mule Deer in the Old Landfill Source Area at RFETS

MULE DEER OLD LANDFILL	EXPOSURE POINT										SUMMARY				
	Vegetation			Surficial Soil			Surface Water			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00044	IR = 0.004	SUF = 0.96					
Analyte	IR = 0.022 SUF = 0.048	IR = 0.048 SUF = 0.96	IR = 0.0044 SUF = 0.96	IR = 0.004 SUF = 0.96											
MAGNESIUM	2448.90	2.59	2298.53	0.05	20.41	0.01	2.64	44.06	0.06	13.83%					
CADMIUM	2.35	2.48E-03	0.88	1.86E-05	1.74E-03	6.70E-07	2.50E-03	0.05	0.05	12.46%					
ARSENIC	5.18	0.01	5.70	1.20E-04	2.27E-03	8.70E-07	0.01	0.11	0.05	11.26%					
SELENIUM	2.37	2.50E-03	0.46	9.70E-06	2.69E-03	1.03E-06	2.51E-03	0.05	0.05	10.88%					
VANADIUM	15.23	0.02	30.43	6.43E-04	0.01	3.34E-06	0.02	0.37	0.04	10.37%					
BARIUM	66.46	0.07	115.59	2.44E-03	0.17	6.37E-05	0.07	2.00	0.04	8.39%					
ALUMINUM	199.13	0.21	11074.66	0.23	1.60	6.14E-04	0.44	13.14	0.03	7.81%					
LITHIUM	52.01	0.05	8.00	1.69E-04	0.01	5.07E-06	0.06	1.63	0.03	7.78%					
TIN	95.41	0.10	9.71	2.05E-04	0.02	8.26E-06	0.10	4.28	0.02	5.44%					
ANTIMONY	ND	—	8.68	1.83E-04	0.02	5.78E-06	1.89E-04	0.01	0.02	4.68%					
MOLYBDENUM	91.51	0.10	7.35	1.55E-04	0.02	8.08E-06	0.10	11.11	0.01	2.01%					
MANGANESE	47.24	0.05	277.66	0.01	0.06	2.46E-05	0.06	15.31	<0.01	0.84%					
COPPER	7.86	0.01	37.70	7.96E-04	0.01	2.32E-06	0.01	2.88	<0.01	0.73%					
NICKEL	14.10	0.01	14.94	3.16E-04	0.01	3.66E-06	0.02	6.96	<0.01	0.50%					
STRONTIUM	79.00	0.08	30.81	6.51E-04	0.49	1.90E-04	0.08	45.74	<0.01	0.42%					
ACROCLOR-1254	NR	4.04E-03	4.26E-06	0.57	1.21E-05	ND	—	1.64E-05	0.01	<0.01	0.40%				
ZINC	44.21	0.05	66.57	1.41E-03	0.02	7.92E-06	0.05	27.83	<0.01	0.40%					
LEAD	1.68	1.78E-03	28.70	6.06E-04	4.24E-03	1.63E-06	2.39E-03	1.39	<0.01	0.40%					
SILVER	5.16	0.01	7.18	1.52E-04	3.64E-03	1.40E-06	0.01	3.81	<0.01	0.34%					
BENZO(a)PYRENE	NR	0.03	3.67E-05	2.64	5.67E-05	ND	—	9.24E-05	0.08	<0.01	0.23%				
MERCURY	ND	—	0.12	2.61E-06	1.12E-04	4.00E-08	2.65E-06	2.40E-03	<0.01	0.23%					
DIELDRIN	NR	8.62E-04	9.10E-07	0.01	2.00E-07	ND	—	1.11E-06	3.43E-03	<0.01	0.07%				
DIBENZO(a,h)ANTHRACENE	NR	0.01	6.54E-06	0.76	1.60E-05	ND	—	2.26E-05	0.08	<0.01	0.07%				
NITRATE/NITRITE	NR	—	NR	—	1.49	5.72E-04	5.72E-04	2.25	<0.01	0.06%					
COBALT	ND	—	8.35	1.76E-04	0.01	3.16E-06	1.79E-04	0.86	<0.01	0.05%					
THALLIUM	ND	—	0.91	1.92E-05	2.11E-03	8.10E-07	2.00E-05	0.11	<0.01	0.04%					
BERYLLIUM	ND	—	0.88	1.86E-05	9.86E-04	3.80E-07	1.90E-05	0.11	<0.01	0.04%					
BENZO(a)ANTHRACENE	NR	0.04	4.53E-05	2.85	6.02E-05	ND	—	1.06E-04	0.77	<0.01	0.03%				
BENZO(b)FLUORANTHENE	NR	0.02	2.07E-05	3.18	6.72E-05	ND	—	8.79E-05	0.77	<0.01	0.03%				
PYRENE	NR	0.31	3.31E-04	7.09	1.50E-04	ND	—	4.81E-04	5.67	<0.01	0.02%				
INDENO(1,2,3-cd)PYRENE	NR	3.53E-03	3.73E-06	2.57	5.43E-05	ND	—	5.81E-05	0.77	<0.01	0.02%				
BENZO(k)FLUORANTHENE	NR	0.01	7.61E-06	1.69	3.58E-05	ND	—	4.34E-05	0.77	<0.01	0.01%				
FLUORANTHENE	NR	0.31	3.25E-04	8.27	1.75E-04	ND	—	5.00E-04	9.45	<0.01	0.01%				
ENDRN KETONE	NR	NO LOG _{KOW}	—	0.01	2.00E-07	ND	—	2.00E-07	3.94E-03	<0.01	0.01%				
ENDOSULFAN SULFATE	NR	2.60E-03	2.74E-06	0.01	1.80E-07	ND	—	2.92E-06	0.06	<0.01	0.01%				
FLUORENE	NR	0.35	3.71E-04	2.36	4.99E-05	ND	—	4.21E-04	9.45	<0.01	0.01%				
ACENAPHTHENE	NR	0.42	4.42E-04	2.64	5.57E-05	ND	—	4.98E-04	13.23	<0.01	0.01%				
BIS(2-ETHYLHEXYL)PHTHALATE	NR	0.02	2.56E-05	0.30	6.44E-06	0.01	3.48E-06	3.55E-05	1.42	<0.01	0.01%				
HEPTACHLOR EPOXIDE	NR	1.29E-03	1.37E-06	4.30E-03	9.00E-08	ND	—	1.46E-06	0.07	<0.01	<0.01%				
PENTACHLOROPHENOL	NR	ND	—	ND	—	0.03	1.03E-05	1.03E-05	0.51	<0.01	<0.01%				
CHRYSENE	NR	0.07	6.99E-05	2.99	6.31E-05	ND	—	1.33E-04	7.73	<0.01	<0.01%				
NAPHTHALENE	NR	1.11	1.17E-03	2.50	5.28E-05	ND	—	1.22E-03	77.28	<0.01	<0.01%				
PHENANTHRENE	NR	0.91	9.62E-04	9.64	2.04E-04	ND	—	1.17E-03	77.28	<0.01	<0.01%				

Summary of Ecotoxicological Risk to Mule Deer in the Old Landfill Source Area at RFETS

MULE DEER OLD LANDFILL	EXPOSURE POINT						SUMMARY				
	Vegetation		Surficial Soil		Surface Water		Total	Toxicity	Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.0044	SUF = 0.96	IR = 0.004	SUF = 0.96
Analyte	IR = 0.022 SUF = 0.048			IR = 0.00044 SUF = 0.048		ND	—	8.31E-06	0.69	<0.01	<0.01%
METHOXYCHLOR	NR	0.01	7.04E-06	0.06	1.27E-06	ND	—	4.51E-03	1.73E-06	4.60E-03	476.07 <0.01
CHROMIUM	4.09	4.32E-03	13.09	2.76E-04	4.51E-04	ND	—	2.20E-07	0.03	<0.01	<0.01%
ALDRIN	NR	1.16E-04	1.20E-07	4.66E-03	1.00E-07	ND	—	9.21E-06	1.74	<0.01	<0.01%
ACETONE	NR	ND	—	ND	—	0.02	—	3.10E-05	6.06	<0.01	<0.01%
BUTYL BENZYL PHTHALATE	NR	0.02	2.39E-05	0.34	7.14E-06	ND	—	3.68E-04	75.59	<0.01	<0.01%
ANTHRACENE	NR	0.29	3.08E-04	2.82	5.95E-05	ND	—	2.25E-05	7.73	<0.01	<0.01%
BENZO[ghi]PERYLENE	NR	2.81E-03	2.97E-06	0.92	1.95E-05	ND	—	1.82E-04	77.28	<0.01	<0.01%
2-METHYLNAPHTHALENE	NR	0.15	1.63E-04	0.94	1.99E-05	ND	—	2.70E-07	0.14	<0.01	<0.01%
4,4'-DDT	NR	8.80E-05	9.00E-08	0.01	1.80E-07	ND	—	3.11E-03	1.20E-06	>1.02	<0.01
METHYLENE CHLORIDE	NR	ND	—	ND	—	3.58E-05	—	9.80E-07	2.61	<0.01	<0.01%
Di-n-BUTYL PHTHALATE	NR	0.03	2.92E-05	0.31	6.61E-06	ND	—	2.54E-03	1.12E-06	11.10	<0.01
CHLOROFORM	NR	ND	—	ND	—	2.90E-03	—	7.12E-06	79.05	<0.01	<0.01%
TRICHLOROETHENE	NR	ND	—	ND	—	9.80E-07	—	2.17E-06	303.37	<0.01	<0.01%
Di-n-OCTYL PHTHALATE	NR	6.20E-05	7.00E-08	0.33	7.05E-06	ND	—	0.01	354.37	<0.01	<0.01%
2-BUTANONE	NR	ND	—	ND	—	0.01	—	1.95E-06	—	—	—
DIETHYL PHTHALATE	NR	ND	—	ND	—	0.01	—	—	—	—	—

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Summary of Ecotoxicological Risk to Mule Deer in the A-Ponds Source Area at RFETS

MULE DEER A-PONDS	EXPOSURE POINT						SUMMARY				
	Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
	UCI ₉₅	Estimated Value	Intake	UCI ₉₅	Intake	UCI ₉₅					
VANADIUM	IR = 0.022 SUF = 0.034	21.79	0.02	NC	—	2.30E-03	2.54E-06	0.02	0.37	0.04	
CADMUM	2.44	1.82E-03	NC	—	9.62E-04	1.07E-06	1.82E-03	0.05	0.04	12.76%	
MAGNESIUM	2232.60	1.68	NC	—	18.85	0.02	1.71	44.06	0.04	12.54%	
SELENIUM	2.52	1.88E-03	ND	—	3.28E-03	3.64E-06	1.89E-03	0.05	0.04	11.48%	
MERCURY	0.10	7.37E-05	ND	—	1.49E-04	1.70E-07	7.39E-05	2.40E-03	0.03	9.97%	
ARSENIC	4.42	3.31E-03	NC	—	3.55E-03	3.94E-06	3.31E-03	0.11	0.03	9.37%	
COBALT	25.99	0.02	NC	—	1.46E-03	1.62E-06	0.02	0.86	0.02	7.35%	
LITHIUM	37.90	0.03	NC	—	0.03	3.39E-05	0.03	1.63	0.02	5.63%	
BARIUM	40.57	0.03	NC	—	0.06	6.86E-05	0.03	2.00	0.02	4.93%	
ALUMINUM	238.69	0.18	NC	—	0.41	4.49E-04	0.18	13.14	0.01	4.41%	
MOLYBDENUM	95.43	0.07	NC	—	3.08E-03	3.41E-06	0.07	11.11	0.01	2.08%	
COPPER	24.12	0.02	NC	—	2.10E-03	2.32E-06	0.02	2.88	0.01	2.03%	
MANGANESE	42.44	0.03	NC	—	0.18	1.99E-04	0.03	15.31	<0.01	0.68%	
NICKEL	18.03	0.01	NC	—	2.78E-03	3.08E-06	0.01	6.96	<0.01	0.63%	
STRONTIUM	112.50	0.08	NC	—	0.28	3.08E-04	0.08	45.74	<0.01	0.60%	
ZINC	57.29	0.04	NC	—	0.01	9.11E-06	0.04	27.83	<0.01	0.50%	
ANTIMONY	ND	—	ND	—	0.01	9.30E-06	9.80E-06	0.01	<0.01	0.34%	
TIN	5.80	4.34E-03	NC	—	ND	—	4.34E-03	4.28	<0.01	0.33%	
LEAD	1.11	8.28E-04	NC	—	3.32E-03	3.68E-06	8.32E-04	1.39	<0.01	0.19%	
METHYLENE CHLORIDE	NR	—	NR	—	2.94E-03	1.25E-06	3.25E-06	1.02	<0.01	<0.01%	
SILVER	ND	—	ND	—	1.86E-03	2.06E-06	2.06E-06	3.81	<0.01	<0.01%	
Di-n-BUTYL PHTHALATE	NR	ND	—	ND	—	4.83E-03	5.35E-06	5.35E-06	42.53	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the B-Ponds Source Area at RFETS

MULE DEER B-PONDS	EXPOSURE POINT						SUMMARY			
	Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	Estimated UCL ₉₅	Value	Intake UCL ₉₅	Intake SUF = 0.025	Intake UCL ₉₅	Intake SUF = 0.169				
Analyte	IR = 0.022 SUF = 0.025	0.09	48139.56	0.53	0.26	1.79E-04	0.62	13.14	0.05	16.97%
ALUMINUM	172.53	0.01	80.61	8.87E-04	2.85E-03	1.93E-06	0.01	0.37	0.04	13.43%
VANADIUM	23.81	1.55E-03	ND	—	2.02E-03	1.37E-06	1.55E-03	0.05	0.03	10.41%
SELENIUM	2.82	1.12E-03	ND	—	9.86E-04	6.70E-07	1.12E-03	0.05	0.02	8.63%
CADMIUM	2.03	0.92	8678.88	0.10	15.50	0.01	1.02	44.06	0.02	8.30%
MAGNESIUM	1669.75	0.10	5.34E-05	ND	—	2.75E-04	1.90E-07	5.35E-05	2.40E-03	0.02
MERCURY	4.44	2.44E-03	8.55	9.41E-05	2.25E-03	1.52E-06	2.54E-03	0.11	0.02	7.91%
ARSENIC	53.77	0.03	337.48	3.71E-03	0.05	3.48E-05	0.03	2.00	0.02	5.98%
BARIUM	25.51	0.01	13.25	1.46E-04	1.58E-03	1.07E-06	0.01	0.86	0.02	5.91%
COBALT	45.27	0.02	NC	—	0.02	1.17E-05	0.02	1.63	0.02	5.45%
LITHIUM	29.45	0.02	21.78	2.40E-04	ND	—	0.02	2.88	0.01	2.04%
COPPER	40.49	0.02	ND	—	0.01	4.29E-06	0.02	4.28	0.01	1.86%
TIN	82.01	0.05	ND	—	0.01	4.97E-06	0.05	11.11	<0.01	1.45%
MOLYBDENUM	116.03	0.06	112.99	1.24E-03	0.03	1.76E-05	0.07	27.83	<0.01	0.83%
ZINC	53.95	0.03	509.65	0.01	0.10	6.63E-05	0.04	15.31	<0.01	0.82%
MANGANESE	13.89	0.01	18.05	1.99E-04	3.56E-03	2.40E-06	0.01	6.96	<0.01	0.40%
NICKEL	1.27	7.01E-04	55.00	6.05E-04	0.01	3.46E-06	1.31E-03	1.39	<0.01	0.34%
LEAD	66.45	0.04	NC	—	0.26	1.72E-04	0.04	45.74	<0.01	0.29%
SILVER	5.01	2.75E-03	ND	—	ND	—	2.75E-03	3.81	<0.01	0.26%
BERYLLIUM	ND	—	6.57	7.22E-05	1.79E-04	1.20E-07	7.23E-05	0.11	<0.01	0.23%
ANTIMONY	ND	—	ND	—	0.01	5.75E-06	5.75E-06	0.01	<0.01	0.22%
AROCLOR-1254	0.01	5.61E-06	ND	—	NR	—	5.61E-06	0.01	<0.01	0.22%
THALLIUM	ND	—	3.05	3.35E-05	ND	—	3.35E-05	0.11	<0.01	0.11%
CHROMIUM	5.29	2.91E-03	48.86	5.37E-04	2.21E-03	1.50E-06	3.45E-03	476.07	<0.01	<0.01%
ACETONE	NR	—	NR	—	0.01	7.15E-06	7.15E-06	1.74	<0.01	<0.01%
TETRACHLOROETHENE	NR	—	NR	—	3.66E-03	2.47E-06	2.47E-06	1.06	<0.01	<0.01%
1,2-DICHLOROETHENE	NR	—	NR	—	2.53E-03	1.71E-06	1.71E-06	1.29	<0.01	<0.01%
CHLOROFORM	NR	—	NR	—	2.26E-03	1.53E-06	1.53E-06	2.61	<0.01	<0.01%
1,2-DICHLOROETHANE	NR	—	NR	—	2.54E-03	1.72E-06	1.72E-06	4.07	<0.01	<0.01%
TRICHLOROETHENE	NR	—	NR	—	2.88E-03	1.94E-06	1.94E-06	11.10	<0.01	<0.01%
Di-n-BUTYL PHTHALATE	NR	ND	—	ND	4.98E-03	3.36E-06	3.36E-06	42.53	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the East Trenches Source Area at RFETS

MULE DEER EAST TRENCHES		EXPOSURE POINT						SUMMARY				
		Vegetation Estimated Value		Surficial Soil UCL ₉₅ Intake		Surface Water UCL ₉₅ Intake IR = 1 CUF = 1		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
Analyte		IR = 0.022 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	IR = 0.00044 SUF = 0.143	
CADMIUM		2.22	0.01	1.44	9.05E-05	NR	—	0.01	0.05	0.15	59.40%	
ALUMINUM		NR	—	12216.91	0.77	NR	—	0.77	13.14	0.06	22.78%	
COPPER		10.43	0.03	13.08	8.23E-04	NR	—	0.03	2.88	0.01	4.55%	
LEAD		1.51	4.75E-03	45.99	2.89E-03	NR	—	0.01	1.39	0.01	2.14%	
VANADIUM		NR	—	27.79	1.75E-03	NR	—	1.75E-03	0.37	<0.01	1.83%	
SILVER		5.10	0.02	3.59	2.26E-04	NR	—	0.02	3.81	<0.01	1.67%	
BARIUM		NR	—	128.84	0.01	NR	—	0.01	2.00	<0.01	1.58%	
ZINC		33.84	0.11	54.00	3.40E-03	NR	—	0.11	27.83	<0.01	1.54%	
MAGNESIUM		NR	—	2431.74	0.15	NR	—	0.15	44.06	<0.01	1.35%	
ARSENIC		NR	—	5.50	3.46E-04	NR	—	3.46E-04	0.11	<0.01	1.18%	
MANGANESE		NR	—	310.49	0.02	NR	—	0.02	15.31	<0.01	0.50%	
SELENIUM		ND	—	0.73	4.62E-05	NR	—	4.62E-05	0.05	<0.01	0.34%	
BERYLLIUM		NR	—	1.56	9.80E-05	NR	—	9.80E-05	0.11	<0.01	0.33%	
COBALT		NR	—	7.14	4.49E-04	NR	—	4.49E-04	0.86	<0.01	0.20%	
LITHIUM		NR	—	13.27	8.35E-04	NR	—	8.35E-04	1.63	<0.01	0.20%	
TIN		NR	—	34.19	2.15E-03	NR	—	2.15E-03	4.28	<0.01	0.20%	
BENZO(a)PYRENE		NR	2.76E-03	8.70E-06	0.21	1.32E-05	NR	—	2.19E-05	0.08	<0.01	0.11%
NICKEL		NR	—	11.63	7.32E-04	NR	—	7.32E-04	6.96	<0.01	0.04%	
CHROMIUM		7.23	0.02	12.98	8.17E-04	NR	—	0.02	476.07	<0.01	0.02%	
BIS(2-ETHYLHEXYL)PHTHALATE		NR	0.02	5.52E-05	0.22	1.39E-05	NR	—	6.90E-05	1.42	<0.01	0.02%
STRONTIUM		NR	—	34.85	2.19E-03	NR	—	2.19E-03	45.74	<0.01	0.02%	
BENZO(a)ANTHRACENE		NR	3.18E-03	—	0.21	1.33E-05	NR	—	2.33E-05	0.77	<0.01	0.01%
BENZO(b)FLUORANTHENE		NR	1.23E-03	—	0.20	1.25E-05	NR	—	1.64E-05	0.77	<0.01	0.01%
PYRENE		NR	0.01	—	0.22	1.37E-05	NR	—	4.42E-05	5.67	<0.01	<0.01%
FLUORANTHENE		NR	0.01	—	0.23	1.44E-05	NR	—	4.12E-05	9.45	<0.01	<0.01%
CHRYSENE		NR	4.22E-03	—	0.19	1.20E-05	NR	—	2.53E-05	7.73	<0.01	<0.01%
PHENANTHRENE		NR	0.02	—	0.21	1.31E-05	NR	—	7.51E-05	77.28	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the 881 Hillside Source Area at RFETS

MULE DEER	EXPOSURE POINT						SUMMARY					
	Vegetation		Surficial Soil		Surface Water		Total	Toxicity	Intake	Reference Value	Hazard Quotient	Percent of Total Risk
	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	IR = 0.00044						
Analyte	SUF = 0.079		SUF = 0.079		SUF = 0.13	IR = 0.004						
SELENIUM	2.51	4.36E-03	0.51	1.78E-05	1.95E-03	1.02E-06	4.38E-03	0.05	0.08		39.25%	
CADMIUM	1.41	2.45E-03	0.61	2.12E-05	1.61E-03	8.40E-07	2.47E-03	0.05	0.05		25.39%	
ALUMINUM	NR	—	14308.32	0.50	0.93	4.82E-04	0.50	13.14	0.04		18.05%	
COPPER	9.56	0.02	35.48	1.23E-03	0.01	4.87E-06	0.02	2.88	0.01		2.95%	
SILVER	9.24	0.02	ND	—	3.41E-03	1.77E-06	0.02	3.81	<0.01		2.01%	
VANADIUM	NR	—	41.86	1.45E-03	0.01	4.59E-06	1.46E-03	0.37	<0.01		1.87%	
LEAD	1.79	3.11E-03	48.00	1.67E-03	3.47E-03	1.80E-06	4.78E-03	1.39	<0.01		1.64%	
BARIUM	NR	—	179.14	0.01	0.12	6.40E-05	0.01	2.00	<0.01		1.50%	
MAGNÉSIUM	NR	—	3418.57	0.12	13.58	0.01	0.13	44.06	<0.01		1.36%	
ZINC	28.74	0.05	85.55	2.97E-03	0.05	2.63E-05	0.05	27.83	<0.01		0.91%	
BENZYL ALCOHOL	NR	1.82	3.16E-03	0.20	7.06E-06	ND	—	3.17E-03	1.77	<0.01	0.85%	
ARSENIC	NR	—	—	5.38	1.87E-04	2.04E-03	1.06E-06	1.88E-04	0.11	<0.01	0.78%	
ACROCLOR-1254	NR	1.82E-03	3.16E-06	0.26	8.95E-06	ND	—	1.21E-05	0.01	<0.01	0.62%	
ANTIMONY	NR	—	ND	—	0.02	1.18E-04	6.00E-08	1.93E-06	0.00	<0.01	0.41%	
MERCURY	ND	—	0.05	1.87E-06	—	—	—	—	—	—	0.38%	
MANGANESE	NR	—	312.55	0.01	0.06	3.26E-05	0.01	15.31	<0.01		0.34%	
ACROCLOR-1248	NR	1.40E-03	2.44E-06	0.12	4.29E-06	ND	—	6.73E-06	—	<0.01	0.32%	
NITRATE/NITRITE	NR	—	2.11	7.34E-05	2.62	1.36E-03	1.44E-03	2.25	<0.01		0.30%	
BERYLLIUM	NR	—	1.26	4.37E-05	9.07E-04	4.70E-07	4.42E-05	0.11	<0.01		0.18%	
TIN	NR	—	43.09	1.50E-03	0.02	1.24E-05	1.51E-03	4.28	<0.01		0.17%	
COBALT	NR	—	8.34	2.90E-04	0.01	3.49E-06	2.93E-04	0.86	<0.01		0.16%	
BENZO(a)PYRENE	NR	4.10E-03	7.13E-06	0.31	1.08E-05	ND	—	1.80E-05	0.08	<0.01	0.11%	
THALLIUM	NR	—	0.66	2.28E-05	1.96E-03	1.02E-06	2.38E-05	0.11	<0.01		0.10%	
LITHIUM	NR	—	9.47	3.29E-04	0.02	• 1.07E-05	3.40E-04	1.63	<0.01		0.10%	
NICKEL	NR	—	29.86	1.04E-03	0.01	3.95E-06	1.04E-03	6.96	<0.01		0.07%	
DIBENZO(a,h)ANTHRACENE	NR	1.54E-03	2.68E-06	0.19	6.57E-06	ND	—	9.25E-06	0.08	<0.01	0.06%	
STRONTIUM	NR	—	61.65	2.14E-03	0.41	2.15E-04	2.36E-03	45.74	<0.01		0.02%	
BENZO(a)ANTHRACENE	NR	4.92E-03	8.55E-06	0.33	1.14E-05	ND	—	1.99E-05	0.77	<0.01	0.01%	
CHROMIUM	5.71	0.01	35.00	1.22E-03	3.95E-03	2.05E-06	0.01	476.07	<0.01		0.01%	
BENZO(b)FLUORANTHENE	NR	1.94E-03	3.36E-06	0.31	1.09E-05	ND	—	1.43E-05	0.77	<0.01	0.01%	
BENZO(k)FLUORANTHENE	NR	1.26E-03	2.20E-06	0.30	1.03E-05	ND	—	1.25E-05	0.77	<0.01	0.01%	
PYRENE	NR	0.03	5.33E-05	0.69	2.41E-05	ND	—	7.74E-05	5.67	<0.01	0.01%	
INDENO(1,2,3-cd)PYRENE	NR	2.79E-04	4.80E-07	0.20	7.08E-06	ND	—	7.56E-06	0.77	<0.01	<0.01%	
TOTAL XYLEMES	NR	NR	—	NR	—	2.51E-03	1.30E-06	0.16	<0.01		<0.01%	
FLUORANTHENE	NR	0.03	4.93E-05	0.76	2.65E-05	ND	—	7.58E-05	9.45	<0.01	<0.01%	
MOLYBDENUM	NR	—	1.93	6.69E-05	0.02	1.09E-05	7.79E-05	11.11	<0.01		<0.01%	
FLUORENE	NR	0.03	4.98E-05	0.19	6.70E-06	ND	—	5.65E-05	9.45	<0.01	<0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	NR	—	ND	—	0.02	7.85E-06	1.42	<0.01		<0.01%	
ACENAPHTHENONE	NR	0.03	5.38E-05	0.19	6.78E-06	ND	—	6.06E-05	13.23	<0.01	<0.01%	
CHRYSENE	NR	0.01	1.39E-05	0.36	1.25E-05	ND	—	2.64E-05	7.73	<0.01	<0.01%	
ACETONE	NR	NR	—	NR	—	0.01	3.64E-06	3.64E-06	1.74	<0.01	<0.01%	
NAPHTHALENE	NR	0.09	1.50E-04	0.19	6.77E-06	ND	—	1.57E-04	77.28	<0.01	<0.01%	
METHYLENE CHLORIDE	NR	NR	—	NR	—	3.79E-03	1.97E-06	1.02	<0.01		<0.01%	

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Summary of Ecotoxicological Risk to Mule Deer in the 881 Hillside Source Area at RFETS

MULE DEER 881 HILLSIDE		EXPOSURE POINT						SUMMARY			
		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte	UCI ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCI ₉₅	Intake	IR = 0.0044	SUF = 0.079	IR = 0.004	SUF = 0.13
PHENANTHRENE	NR	0.05	9.18E-05	0.56	1.94E-05	ND	—	1.11E-04	77.28	<0.01	<0.01%
TETRACHLOROETHENE	NR	NR	—	NR	—	2.82E-03	1.47E-06	1.47E-06	1.06	<0.01	<0.01%
BENZ(ghi)PERYLENE	6.26E-04	1.09E-06	0.21	7.13E-06	ND	—	8.22E-06	7.73	<0.01	<0.01%	
1,2-DICHLOROETHENE	NR	NR	—	NR	—	2.50E-03	1.30E-06	1.30E-06	1.29	<0.01	<0.01%
1,1-DICHLOROETHENE	NR	NR	—	NR	—	2.53E-03	1.32E-06	1.32E-06	1.42	<0.01	<0.01%
CARBON DISULFIDE	NR	NR	—	NR	—	2.57E-03	1.34E-06	1.34E-06	1.88	<0.01	<0.01%
TOLUENE	NR	NR	—	NR	—	2.64E-03	1.37E-06	1.37E-06	2.01	<0.01	<0.01%
ALDRIN	NR	ND	—	ND	—	4.20E-05	2.00E-08	2.00E-08	0.03	<0.01	<0.01%
ANTHRACENE	NR	0.02	3.65E-05	0.20	7.04E-06	ND	—	4.35E-05	75.59	<0.01	<0.01%
1,2-DICHLOROETHANE	NR	NR	—	NR	—	2.66E-03	1.38E-06	1.38E-06	4.07	<0.01	<0.01%
TRICHLOROETHENE	NR	NR	—	NR	—	2.58E-03	1.34E-06	1.34E-06	11.10	<0.01	<0.01%
1,1-DICHLOROETHANE	NR	NR	—	NR	—	2.51E-03	1.31E-06	1.31E-06	17.13	<0.01	<0.01%
ETHYL BENZENE	NR	NR	—	NR	—	2.50E-03	1.30E-06	1.30E-06	23.30	<0.01	<0.01%
1,1,1-TRICHLOROETHANE	NR	NR	—	NR	—	2.52E-03	1.31E-06	1.31E-06	81.35	<0.01	<0.01%
2-BUTANONE	NR	NR	—	NR	—	0.01	2.72E-06	2.72E-06	303.37	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the North Spray Field Source Area at RFETS

MULE DEER NORTH SPRAY FIELD		EXPOSURE POINT						SUMMARY			
		Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Analyte		UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I	SUF = 1	
MAGNESIUM		4253.48		1.50	2325.99	0.02	NR	—	1.51	44.06	0.03
CADMIUM		2.68	9.43E-04	0.99	6.97E-06	NR	—	9.50E-04	0.05	0.02	15.68%
ALUMINUM		347.54	0.12	11487.90	0.08	NR	—	0.20	13.14	0.02	11.83%
BARIUM		83.89	0.03	169.61	1.19E-03	NR	—	0.03	2.00	0.02	11.76%
THALLIUM		4.77	1.68E-03	0.93	6.54E-06	NR	—	1.69E-03	0.11	0.02	11.59%
VANADIUM		13.00	4.57E-03	33.08	2.33E-04	NR	—	4.81E-03	0.37	0.01	9.89%
ANTIMONY		ND	—	15.43	1.09E-04	NR	—	1.09E-04	0.01	0.01	8.92%
NICKEL		23.10	0.01	15.06	1.06E-04	NR	—	0.01	6.96	<0.01	0.91%
MANGANESE		35.25	0.01	319.60	2.25E-03	NR	—	0.01	15.31	<0.01	0.73%
COPPER		6.54	2.30E-03	14.01	9.86E-05	NR	—	2.40E-03	2.88	<0.01	0.64%
LEAD		1.76	6.21E-04	40.40	2.84E-04	NR	—	9.05E-04	1.39	<0.01	0.50%
STRONTIUM		76.34	0.03	31.03	2.18E-04	NR	—	0.03	45.74	<0.01	0.45%
ARSENIC		ND	—	6.62	4.66E-05	NR	—	4.66E-05	0.11	<0.01	0.31%
ZINC		21.24	0.01	48.93	3.45E-04	NR	—	0.01	27.83	<0.01	0.21%
MERCURY		ND	—	0.07	4.60E-07	NR	—	4.60E-07	2.40E-03	<0.01	0.15%
COBALT		ND	—	9.70	6.83E-05	NR	—	6.83E-05	0.86	<0.01	0.06%
SELENIUM		ND	—	0.58	4.05E-06	NR	—	4.05E-06	0.05	<0.01	0.06%
BERYLLIUM		ND	—	0.63	4.46E-06	NR	—	4.46E-06	0.11	<0.01	0.03%
LITHIUM		ND	—	6.56	4.62E-05	NR	—	4.62E-05	1.63	<0.01	0.02%
CHROMIUM		ND	—	12.82	9.02E-05	NR	—	9.02E-05	476.07	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the OU7 Downgradient Areas Source Area at RFETS

MULE DEER OU7 DOWNGRADIENT AREAS	EXPOSURE POINT						SUMMARY			
	Vegetation		Surficial Soil		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = I SUF = 1	IR = I SUF = 1	IR = I SUF = 1
ANALYTE	IR = 0.022 SUF = 0.01	IR = 0.00044 SUF = 0.01								
SELENIUM	4.40	9.68E-04	NR	—	0.01	—	9.68E-04	0.05	0.02	18.50%
VANADIUM	23.12	0.01	NR	—	0.01	—	0.01	0.37	0.01	13.92%
MAGNESIUM	2549.84	0.56	NR	—	25.70	—	0.56	44.06	0.01	12.95%
CADMIUM	2.50	5.50E-04	NR	—	1.85E-03	—	5.50E-04	0.05	0.01	12.07%
ARSENIC	4.93	1.09E-03	NR	—	3.31E-03	—	1.09E-03	0.11	0.01	9.64%
LITHIUM	43.21	0.01	NR	—	0.63	—	0.01	1.63	0.01	5.92%
BARIUM	52.80	0.01	NR	—	0.19	—	0.01	2.00	0.01	5.92%
TIN	98.49	0.02	NR	—	0.03	—	0.02	4.28	0.01	5.15%
BERYLLIUM	2.59	5.70E-04	NR	—	ND	—	5.70E-04	0.11	<0.01	5.07%
ALUMINUM	212.41	0.05	NR	—	0.40	—	0.05	13.14	<0.01	3.62%
COPPER	42.78	0.01	NR	—	0.01	—	0.01	2.88	<0.01	3.32%
MOLYBDENUM	103.42	0.02	NR	—	0.03	—	0.02	11.11	<0.01	2.08%
NICKEL	18.74	4.12E-03	NR	—	0.01	—	4.12E-03	6.96	<0.01	0.60%
STRONTIUM	91.65	0.02	NR	—	0.77	—	0.02	45.74	<0.01	0.45%
MANGANESE	18.57	4.09E-03	NR	—	0.08	—	4.09E-03	15.31	<0.01	0.27%
ZINC	32.78	0.01	NR	—	0.06	—	0.01	27.83	<0.01	0.26%
LEAD	1.53	3.37E-04	NR	—	0.01	—	3.37E-04	1.39	<0.01	0.25%
NITRATE/NITRITE	NR	—	10.78	4.74E-05	1.06	—	4.74E-05	2.25	<0.01	0.02%
CHROMIUM	7.41	1.63E-03	NR	—	ND	—	1.63E-03	476.07	<0.01	<0.01%

HAZARD INDEX 0.10

Summary of Ecotoxicological Risk to Mule Deer in the C-Ponds Source Area at RFETS

MULE DEER C-PONDS Analyte	EXPOSURE POINT						SUMMARY					
	Vegetation			Surficial Soil			Surface Water			Hazard Quotient		
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.00044 SUF = 0.039	IR = 0.004 SUF = 0.198	Total Intake	Toxicity Reference Value	Percent of Total Risk
CADMIUM	2.48		2.13E-03	ND	—	—	2.59E-03	2.05E-06	2.13E-03	0.05	0.05	87.03%
COPPER	8.93	0.022 SUF = 0.039	0.01	NC	—	0.01	6.32E-06	0.01	2.88	<0.01	5.03%	
ANTIMONY	NR		—	ND	—	0.02	1.22E-05	1.22E-05	0.01	<0.01	2.47%	
ZINC	41.40		0.04	NC	—	0.05	3.84E-05	0.04	27.83	<0.01	2.41%	
LEAD	1.36		1.16E-03	NC	—	0.01	5.00E-06	1.17E-03	1.39	<0.01	1.59%	
MAGNESIUM	NR		—	NC	—	10.77	0.01	0.01	44.06	<0.01	0.37%	
NITRATE/NITRITE	NR		—	NR	—	0.54	4.28E-04	4.28E-04	2.25	<0.01	0.36%	
ALUMINUM	NR		—	NC	—	2.43	1.93E-03	1.93E-03	13.14	<0.01	0.28%	
MERCURY	ND		—	ND	—	1.41E-04	1.10E-07	1.10E-07	2.40E-03	<0.01	0.09%	
BARIUM	NR		—	NC	—	0.11	8.65E-05	8.65E-05	2.00	<0.01	0.08%	
SELENIUM	ND		—	NC	—	1.85E-03	1.47E-06	1.47E-06	0.05	<0.01	0.05%	
VANADIUM	NR		—	NC	—	0.01	9.17E-06	9.17E-06	0.37	<0.01	0.05%	
CHROMIUM	10.96		0.01	NC	—	4.76E-03	3.77E-06	9.40E-03	476.07	<0.01	0.04%	
THALLIUM	NR		—	ND	—	2.34E-03	1.85E-06	1.85E-06	0.11	<0.01	0.03%	
ARSENIC	NR		—	NC	—	2.23E-03	1.76E-06	1.76E-06	0.11	<0.01	0.03%	
LITHIUM	NR		—	NC	—	0.02	1.64E-05	1.64E-05	1.63	<0.01	0.02%	
COBALT	NR		—	NC	—	0.01	6.29E-06	6.29E-06	0.86	<0.01	0.01%	
BERYLLIUM	NR		—	ND	—	9.99E-04	7.90E-07	7.90E-07	0.11	<0.01	0.01%	
ACETONE	NR	NR	—	NR	—	0.01	1.15E-05	1.15E-05	1.74	<0.01	0.01%	
MANGANESE	NR		—	NC	—	0.12	9.51E-05	9.51E-05	15.31	<0.01	0.01%	
STRONTIUM	NR		—	NC	—	0.34	2.67E-04	2.67E-04	45.74	<0.01	0.01%	
TIN	NR		—	NC	—	0.02	1.70E-05	1.70E-05	4.28	<0.01	0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	NR	ND	—	ND	—	0.01	4.27E-06	4.27E-06	1.42	<0.01	0.01%	
METHYLENE CHLORIDE	NR	NR	—	NR	—	3.67E-03	2.90E-06	2.90E-06	1.02	<0.01	0.01%	
MOLYBDENUM	NR		—	ND	—	0.02	1.86E-05	1.86E-05	11.11	<0.01	<0.01%	
CARBON DISULFIDE	NR	NR	—	NR	—	2.52E-03	1.99E-06	1.99E-06	1.88	<0.01	<0.01%	
NICKEL	NR		—	NC	—	0.01	6.87E-06	6.87E-06	6.96	<0.01	<0.01%	
TOLUENE	NR	NR	—	NR	—	2.52E-03	1.99E-06	1.99E-06	2.01	<0.01	<0.01%	
CHLOROFORM	NR	NR	—	NR	—	2.57E-03	2.04E-06	2.04E-06	2.61	<0.01	<0.01%	
SILVER	ND		—	ND	—	3.50E-03	2.85E-06	2.85E-06	3.81	<0.01	<0.01%	
2-BUTANONE	NR	NR	—	NR	—	0.01	4.60E-06	4.60E-06	303.37	<0.01	<0.01%	

HAZARD INDEX 0.05

Summary of Ecotoxicological Risk to Mule Deer in the OU6 Burial Trenches Source Area at RFETS

MULE DEER OU6 BURIAL TRENCHES	EXPOSURE POINT						SUMMARY				
	Vegetation Estimated UCI ₉₅		Surficial Soil Intake UCL ₉₅		Surface Water Intake UCI ₉₅ IR = 1 SUF = 1		Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
CADMIUM	IR = 0.022 SUF = 0.004	2.40	2.11E-04	NR	—	NR	—	2.11E-04	0.05	<0.01	12.35%
VANADIUM		19.20	1.69E-03	NR	—	NR	—	1.69E-03	0.37	<0.01	12.32%
SELENIUM		2.58	2.27E-04	NR	—	NR	—	2.27E-04	0.05	<0.01	11.57%
ARSENIC		5.13	4.51E-04	NR	—	NR	—	4.51E-04	0.11	<0.01	10.69%
MERCURY		0.10	8.91E-06	NR	—	NR	—	8.91E-06	2.40E-03	<0.01	10.06%
MAGNESIUM		1586.86	0.14	NR	—	NR	—	0.14	44.06	<0.01	8.59%
LITHIUM		49.67	4.37E-03	NR	—	NR	—	4.37E-03	1.63	<0.01	7.25%
BARIUM		48.77	4.29E-03	NR	—	NR	—	4.29E-03	2.00	<0.01	5.82%
ALUMINUM		296.49	0.03	NR	—	NR	—	0.03	13.14	<0.01	5.38%
BERYLLIUM		2.54	2.23E-04	NR	—	NR	—	2.23E-04	0.11	<0.01	5.28%
TIN		93.84	0.01	NR	—	NR	—	0.01	4.28	<0.01	5.23%
MOLYBDENUM		102.91	0.01	NR	—	NR	—	0.01	11.11	<0.01	2.21%
COPPER		19.59	1.72E-03	NR	—	NR	—	1.72E-03	2.88	<0.01	1.62%
NICKEL		17.30	1.52E-03	NR	—	NR	—	1.52E-03	6.96	<0.01	0.59%
MANGANESE		21.32	1.88E-03	NR	—	NR	—	1.88E-03	15.31	<0.01	0.33%
STRONTIUM		50.06	4.40E-03	NR	—	NR	—	4.40E-03	45.74	<0.01	0.26%
ZINC		26.86	2.36E-03	NR	—	NR	—	2.36E-03	27.83	<0.01	0.23%
LEAD		1.18	1.04E-04	NR	—	NR	—	1.04E-04	1.39	<0.01	0.20%
CHROMIUM		4.49	3.95E-04	NR	—	NR	—	3.95E-04	476.07	<0.01	<0.01%

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Summary of Ecotoxicological Risk to Mule Deer in the Mound Area Source Area at RFETS

MULE DEER MOUND AREA	EXPOSURE POINT										SUMMARY			
	Vegetation			Surficial Soil			Surface Water				Hazard Quotient	Percent of Total Risk		
	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Total Intake	Toxicity Reference Value	Hazard Quotient					
ANALUMINUM	IR = 0.022 SUF = 0.008	NR	—	15228.01	0.05	NR	—	0.05	13.14	<0.01	50.32%			
AROCLOR-1254	NR	0.02	3.78E-06	3.04	1.07E-05	NR	—	1.45E-05	0.01	<0.01	19.19%			
AROCLOR-1260	NR	0.01	1.23E-06	1.78	6.25E-06	NR	—	7.48E-06	0.01	<0.01	9.91%			
VANADIUM	NR	—	50.76	1.79E-04	NR	—	1.79E-04	0.37	<0.01	5.93%				
ARSENIC	NR	—	9.35	3.29E-05	NR	—	3.29E-05	0.11	<0.01	3.55%				
BARIUM	NR	—	160.34	5.64E-04	NR	—	5.64E-04	2.00	<0.01	3.49%				
MAGNESIUM	NR	—	3527.10	0.01	NR	—	0.01	44.06	<0.01	3.47%				
MANGANESE	NR	—	338.31	1.19E-03	NR	—	1.19E-03	15.31	<0.01	0.96%				
THALLIUM	NR	—	2.33	8.20E-06	NR	—	8.20E-06	0.11	<0.01	0.91%				
LEAD	NR	—	19.45	6.85E-05	NR	—	6.85E-05	1.39	<0.01	0.61%				
COBALT	NR	—	10.19	3.59E-05	NR	—	3.59E-05	0.86	<0.01	0.52%				
LITHIUM	NR	—	11.19	3.94E-05	NR	—	3.94E-05	1.63	<0.01	0.30%				
COPPER	NR	—	15.23	5.36E-05	NR	—	5.36E-05	2.88	<0.01	0.23%				
BENZO(a)PYRENE	NR	2.25E-03	4.00E-07	0.17	6.00E-07	NR	—	1.00E-06	0.08	<0.01	0.16%			
STRONTIUM	NR	—	129.27	4.55E-04	NR	—	4.55E-04	45.74	<0.01	0.12%				
ZINC	NR	—	66.49	2.34E-04	NR	—	2.34E-04	27.83	<0.01	0.10%				
BIS(2-ETHYLHEXYL)PHTHALATE	NR	0.04	7.53E-06	0.54	1.90E-06	NR	—	9.43E-06	1.42	<0.01	0.08%			
NICKEL	NR	—	11.67	4.11E-05	NR	—	4.11E-05	6.96	<0.01	0.07%				
INDENO(1,2,3-cd)PYRENE	NR	7.64E-04	1.30E-07	0.56	1.96E-06	NR	—	2.09E-06	0.77	<0.01	0.03%			
BENZO(b)FLUORANTHENE	NR	2.09E-03	3.70E-07	0.34	1.19E-06	NR	—	1.56E-06	0.77	<0.01	0.02%			
BENZO(a)ANTHRACENE	NR	2.70E-03	4.70E-07	0.18	6.30E-07	NR	—	1.10E-06	0.77	<0.01	0.02%			
PYRENE	NR	0.01	1.61E-06	0.21	7.30E-07	NR	—	2.34E-06	5.67	<0.01	0.01%			
FLUORANTHENE	NR	0.01	1.83E-06	0.28	9.80E-07	NR	—	2.81E-06	9.45	<0.01	<0.01%			
BENZO(ghi)PERYLENE	NR	1.70E-03	3.00E-07	0.56	1.96E-06	NR	—	2.26E-06	7.73	<0.01	<0.01%			
PHENANTHRENE	NR	0.04	7.58E-06	0.46	1.61E-06	NR	—	9.19E-06	77.28	<0.01	<0.01%			
CHROMIUM	NR	—	12.86	4.53E-05	NR	—	4.53E-05	476.07	<0.01	<0.01%				
CHRYSENE	NR	2.22E-03	3.90E-07	0.10	3.50E-07	NR	—	7.40E-07	7.73	<0.01	<0.01%			

HAZARD INDEX 0.01

SUMMARY OF ECOLOGICAL RISK TO VEGETATION

ERA source areas evaluated: All

Exposure Points: surface and subsurface soil

Highest risk source area: Ash Pits

PCOCs with HQ > 10: Ag, Be, Cd, Cu, Cr, Sb, Pb, Ni, Zn, nitrate/nitrite

Key uncertainties in exposure and risk estimate:

- Toxicity information not available for many organic compounds
- TRVs for metals based on higher bioavailability than probably exists at RFETS
- TRVs derived from data on a limited number of taxa

Suggested further action:

ECOCs: Ag, Be, Cd, Cu, Cr, Sb, Pb, Ni, Zn, nitrate/nitrite

1. Search for more information on toxicity of organic compounds
2. Evaluate vegetation community data for evidence of phytotoxicity
3. Identify riparian and wetland areas with potentially phytotoxic concentrations of ECOCs or organics

**Summary of Ecotoxicological Risk to Vegetation from Ecological Chemicals of Concern (ECOCs) in
Subsurface Soil**

Source Area	ECOCs (PCOCs Exceeding TRV)	Group	UCL ₉₅	Maximum Detected Concentration in Subsurface Soil (Max)	Vegetation Toxicity Reference		Hazard Quotient (Max:TRV)
					Value (TRV)	Units	
Burial Trenches	BARIUM	M	340	2970	500	MG/KG	6
	MANGANESE	M	328	2930	500	MG/KG	6
	CHROMIUM	M	13.3	130	22.9	MG/KG	6
	STRONTIUM	M	96.2	264	62.9	MG/KG	4
	ANTIMONY	M	7.11	14.1	7.14	MG/KG	2
	MOLYBDENUM	M	3.36	27.9	16.9	MG/KG	2
	COBALT	M	7.89	28.8	20	MG/KG	1
	ZINC	M	29.8	68.5	50	MG/KG	1
	ARSENIC	M	4.28	13.6	10	MG/KG	1
	VANADIUM	M	18.7	40.1	36.3	MG/KG	1
C-Ponds	CHROMIUM	M	62.0	73.9	22.9	MG/KG	3
	ZINC	M	55.3	58.2	50	MG/KG	1
	STRONTIUM	M	61.0	64.1296	62.9	MG/KG	1
Downgradient Areas	NITRATE/NITRITE	W	3231	20000	19.1	MG/KG	1047
	STRONTIUM	M	101	197	62.9	MG/KG	3
	ZINC	M	73.8	99.2	50	MG/KG	2
	MANGANESE	M	332	896	500	MG/KG	2
	SELENIUM	M	0.962	1.9	1.45	MG/KG	1
	NICKEL	M	20.4	38.2	30	MG/KG	1
	BARIUM	M	199	624	500	MG/KG	1
	VANADIUM	M	25.9	43.6	36.3	MG/KG	1
	ARSENIC	M	4.93	11.4	10	MG/KG	1
	ALUMINUM	M	10396	16100	14600	MG/KG	1
	COBALT	M	10.6	21	20	MG/KG	1
	ZINC	M	42.3	437	50	MG/KG	9
East Trenches	STRONTIUM	M	59.4	545	62.9	MG/KG	9
	MANGANESE	M	276	3160	500	MG/KG	6
	CHROMIUM	M	15.5	127	22.9	MG/KG	6
	SELENIUM	M	0.584	3.4	1.45	MG/KG	2
	VANADIUM	M	27.2	80.4	36.3	MG/KG	2
	ALUMINUM	M	10964	27900	14600	MG/KG	2
	ARSENIC	M	5.17	18.4	10	MG/KG	2
	BARIUM	M	114	671	500	MG/KG	1
	NICKEL	M	14.7	33.6	30	MG/KG	1
	ANTIMONY	M	4.27	7.3	7.14	MG/KG	1
	ZINC	M	42.3	437	50	MG/KG	9
Mound Area	ANTIMONY	M	11.3	22.4	7.14	MG/KG	3
	STRONTIUM	M	92.9	163	62.9	MG/KG	3
	ZINC	M	69.8	99.1	50	MG/KG	2
	MANGANESE	M	320	635	500	MG/KG	1
	NICKEL	M	24.3	33	30	MG/KG	1

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**Summary of Ecotoxicological Risk to Vegetation from Ecological Chemicals of Concern (ECOCs) in
Subsurface Soil**

Source Area	ECOCs (PCOCs Exceeding TRV)	Group	UCL ₉₅	Maximum Detected Concentration in Subsurface Soil (Max)		Toxicity Reference Value (TRV)	Units	Vegetation Hazard Quotient (Max:TRV)
				Subsurface Soil	Concentration in			
North Spray Field	CHROMIUM	M	28.6	217		22.9	MG/KG	9
	ZINC	M	50.4	287		50	MG/KG	6
	ANTIMONY	M	9.54	22.3		7.14	MG/KG	3
	STRONTIUM	M	36.4	135		62.9	MG/KG	2
	BARIUM	M	148	866		500	MG/KG	2
	ALUMINUM	M	10713	23800		14600	MG/KG	2
	VANADIUM	M	29.7	50.4		36.3	MG/KG	1
	NICKEL	M	16.4	41.5		30	MG/KG	1
Old Landfill	COPPER	M	262	6920		100	MG/KG	69
	ZINC	M	102	673		50	MG/KG	13
	MOLYBDENUM	M	7.52	190		16.9	MG/KG	11
	CHROMIUM	M	20.5	165		22.9	MG/KG	7
	ACENAPHTHENE	S	1625	31000		5000	UG/KG	6
	LEAD	M	35.4	304		50	MG/KG	6
	SILVER	M	3.20	36		7.42	MG/KG	5
	MERCURY	M	0.179	1.4		0.3	MG/KG	5
	NICKEL	M	22.7	118		30	MG/KG	4
	MANGANESE	M	296	1540		500	MG/KG	3
	NAPHTHALENE	S	2932	61000		20000	UG/KG	3
	ANTIMONY	M	5.94	19.5		7.14	MG/KG	3
	STRONTIUM	M	38.2	131		62.9	MG/KG	2
	VANADIUM	M	30.9	74.4		36.3	MG/KG	2
	ARSENIC	M	5.06	18.9		10	MG/KG	2
	ALUMINUM	M	9352	21600		14600	MG/KG	1
	COBALT	M	8.55	27.1		20	MG/KG	1
Soil Dump Areas	ZINC	M	51.1	706		50	MG/KG	14
	STRONTIUM	M	102	506		62.9	MG/KG	8
	VANADIUM	M	26.3	118		36.3	MG/KG	3
	ANTIMONY	M	8.30	16.8		7.14	MG/KG	2
	BARIUM	M	166	1050		500	MG/KG	2
	LEAD	M	13.9	84.9		50	MG/KG	2
	ALUMINUM	M	8160	24100		14600	MG/KG	2
	MANGANESE	M	143	719		500	MG/KG	1
	NICKEL	M	10.9	34.9		30	MG/KG	1
	PENTACHLOROPHENOL	S	947	660		600	UG/KG	1
	COBALT	M	6.43	21.4		20	MG/KG	1
West Spray Field	ZINC	M	18.1	98.2		50	MG/KG	2
	MANGANESE	M	205	885		500	MG/KG	2
	ALUMINUM	M	8642	21500		14600	MG/KG	1
	VANADIUM	M	22.0	49.7		36.3	MG/KG	1
	STRONTIUM	M	16.3	80.3		62.9	MG/KG	1

Note: ECOCs were not identified in the following source areas: B-Ponds, Other Outside Closures, and Surface Disturbance

PCOC - potential chemical of concern

UCL₉₅ - 95% upper confidence limit of the true mean (based on a 1-tailed test)

M - metal

W - water quality parameter

S - semivolatile organic compound

MG/KG - milligrams per kilogram

UG/KG - micrograms per kilogram

Summary of Ecotoxicological Risk to Vegetation from Ecological Chemicals of Concern (ECOCs) in Subsurface Soil

Source Area	ECOCs (PCOCs Exceeding TRV)	Group	UCL ₉₅	Maximum Detected Concentration in Subsurface Soil (Max)	Vegetation Toxicity Reference Value (TRV)	Hazard Quotient (Max:TRV)	
						Units	
881 Hillside	ANTIMONY	M	10.4	57	7.14	MG/KG	8
	MERCURY	M	0.0851	2.2	0.3	MG/KG	7
	CHROMIUM	M	15.9	101	22.9	MG/KG	4
	ZINC	M	59.4	184	50	MG/KG	4
	MANGANESE	M	264	1500	500	MG/KG	3
	STRONTIUM	M	88.6	172	62.9	MG/KG	3
	NICKEL	M	16.6	70.1	30	MG/KG	2
	ALUMINUM	M	11926	30000	14600	MG/KG	2
	VANADIUM	M	30.7	71.7	36.3	MG/KG	2
	ARSENIC	M	4.68	18.1	10	MG/KG	2
	COBALT	M	7.51	36	20	MG/KG	2
	BARIUM	M	166	836	500	MG/KG	2
	SELENIUM	M	0.691	1.8	1.45	MG/KG	1
	CADMUM	M	0.621	3.6	3	MG/KG	1
903 Pad	ZINC	M	58.9	200	50	MG/KG	4
	COBALT	M	9.14	78.1	20	MG/KG	4
	SELENIUM	M	0.731	5.3	1.45	MG/KG	4
	CHROMIUM	M	15.8	69.2	22.9	MG/KG	3
	BARIUM	M	136	1500	500	MG/KG	3
	STRONTIUM	M	60.8	169	62.9	MG/KG	3
	ANTIMONY	M	6.11	17	7.14	MG/KG	2
	NICKEL	M	16.7	70.1	30	MG/KG	2
	NITRATE/NITRITE	W	2.21	43.6	19.1	MG/KG	2
	VANADIUM	M	32.4	81.2	36.3	MG/KG	2
	MANGANESE	M	247	963	500	MG/KG	2
	ALUMINUM	M	10841	23600	14600	MG/KG	2
	ARSENIC	M	4.23	14	10	MG/KG	1
Ash Pits	CHROMIUM	M	176	8310	22.9	MG/KG	363
	NICKEL	M	109	4750	30	MG/KG	158
	ZINC	M	151	2390	50	MG/KG	48
	SILVER	M	14.7	311	7.42	MG/KG	42
	COPPER	M	113	2920	100	MG/KG	29
	ANTIMONY	M	9.48	149	7.14	MG/KG	21
	CADMUM	M	3.14	56.9	3	MG/KG	19
	LEAD	M	55.6	935	50	MG/KG	19
	BERYLLIUM	M	3.61	131	10	MG/KG	13
	MOLYBDENUM	M	4.53	129	16.9	MG/KG	8
	MERCURY	M	0.0898	1.2	0.3	MG/KG	4
	COBALT	M	11.0	67.6	20	MG/KG	3
	VANADIUM	M	34.9	93.5	36.3	MG/KG	3
	MANGANESE	M	315	1260	500	MG/KG	3
	ALUMINUM	M	13648	32800	14600	MG/KG	2
	ARSENIC	M	4.14	17.3	10	MG/KG	2
	STRONTIUM	M	44.0	95.9	62.9	MG/KG	2
	BARIUM	M	172	683	500	MG/KG	1
A-Ponds	ZINC	M	78.5	50.3	50	MG/KG	1

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Definitions and Footnotes

I Incomplete Pathway
IR Ingestion Rate
OU Operable Unit
NC Not Calculated
ND Not Detected in Lab Samples
NR Not Represented in Sample Information
RFETS Rocky Flats Environmental Technology Site
SUF Site Use Factor

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SUMMARY OF ECOLOGICAL RISK TO GREAT BLUE HERONS

ERA source areas evaluated: 881 Hillside (sections of Woman Creek)
A-Ponds
B-Ponds
C-Ponds

Exposure Points: Fish
Surface water
Sediment

Highest risk source area: 881 Hillside (HI = 42.6)

PCOCs with HQ > 10: di-n-butyl-phthalate
bis(2-ethylhexyl)phthalate

Key uncertainties in exposure and risk estimate:

- Concentration of di-n-butyl-phthalate in prey was not measured. Tissue concentrations were estimated from surface water data, BCFs are based on K_{ow} , and assume no metabolism.
- Data on PCB and pesticide concentrations in invertebrate and fish tissue are available, but transfer of other semi-volatile organic PCOCs from sediments to fish was not estimated.
- Although fish apparently do not occur in all ponds or stream segments, the risk estimate assumes that prey can be obtained from all aquatic habitats.

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SUMMARY OF ECOLOGICAL RISK TO
GREAT BLUE HERONS
(continued)

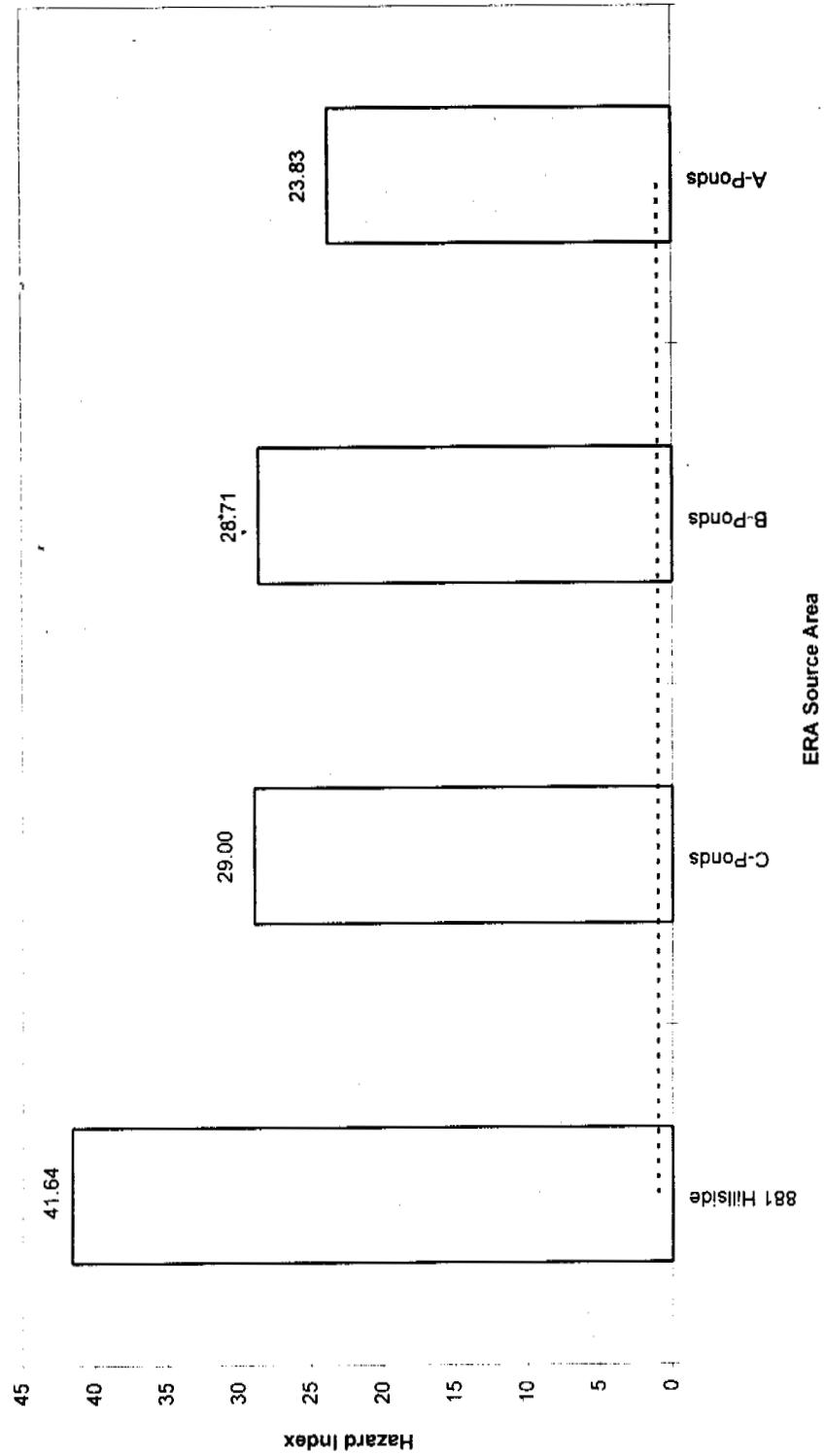
Suggested further action:

ECOCs: di-n-butyl-phthalate in surface water
bis(2-ethylhexyl)phthalate in surface water
PCBs in sediments
PAHs in sediments
Mercury in Woman Creek and C-pond sediments

1. Evaluate phthalate sources in areas with HQ > 1. Identify sample locations and assess risk contribution from stream segments and ponds
2. Evaluate potential bioaccumulation of PAHs from sediments in aquatic prey
3. Assess PAH and PCB risk contribution from stream segments and ponds
4. Evaluate mercury data from Woman Creek source areas to determine whether sources are in the stream system and whether conditions are favorable for organically transformed mercury
5. Conduct more intensive exposure analysis including:
 - distribution of PCBs and PAHs among ponds and sediment depths
 - occurrence and availability of appropriate aquatic prey in ponds and streams
 - seasonal exposure patterns

Summary of Ecotoxicological Risk to Great Blue Heron at RFETS

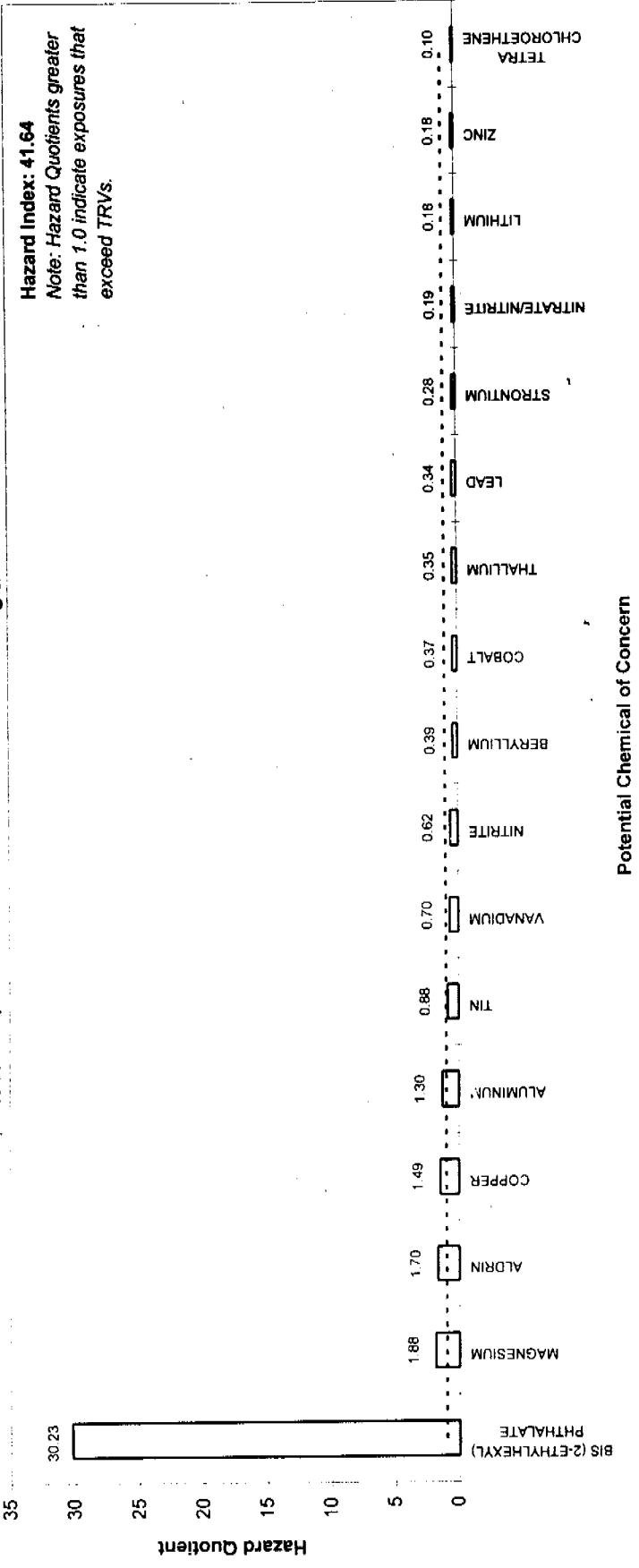
**Contribution of ERA Source Areas to Great Blue Heron
Risk of Toxic Exposure**



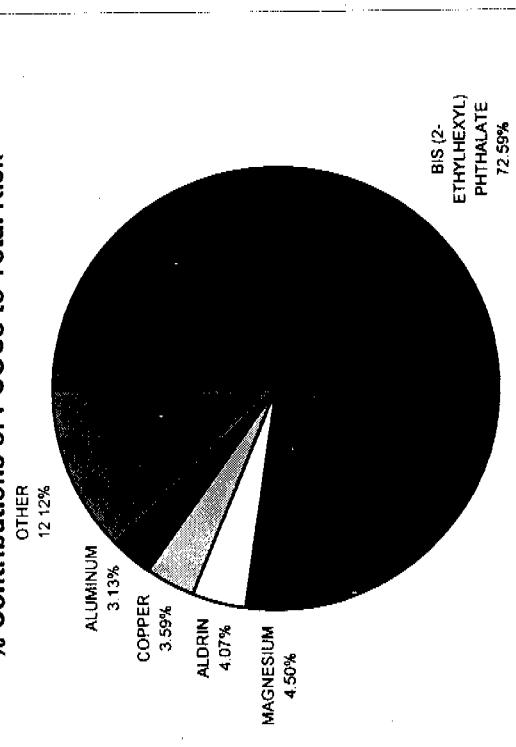
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Summary of Ecotoxicological Risk to Great Blue Heron in the 881 Hillside Source Area at RFETS

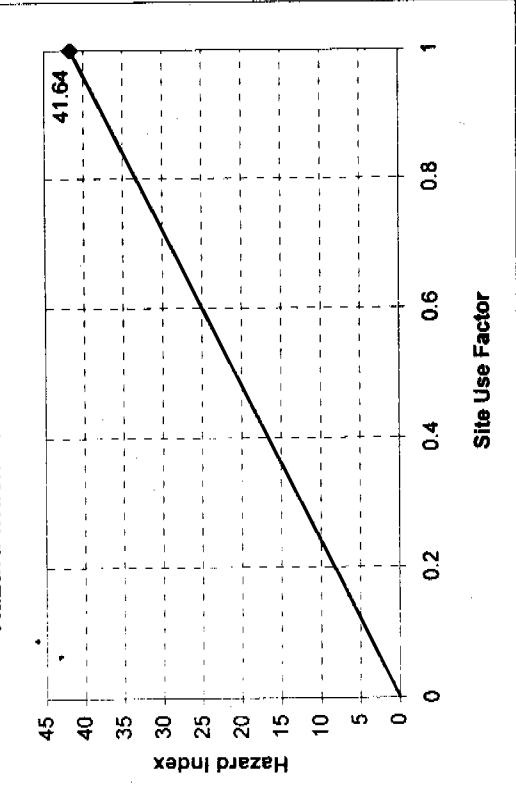
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

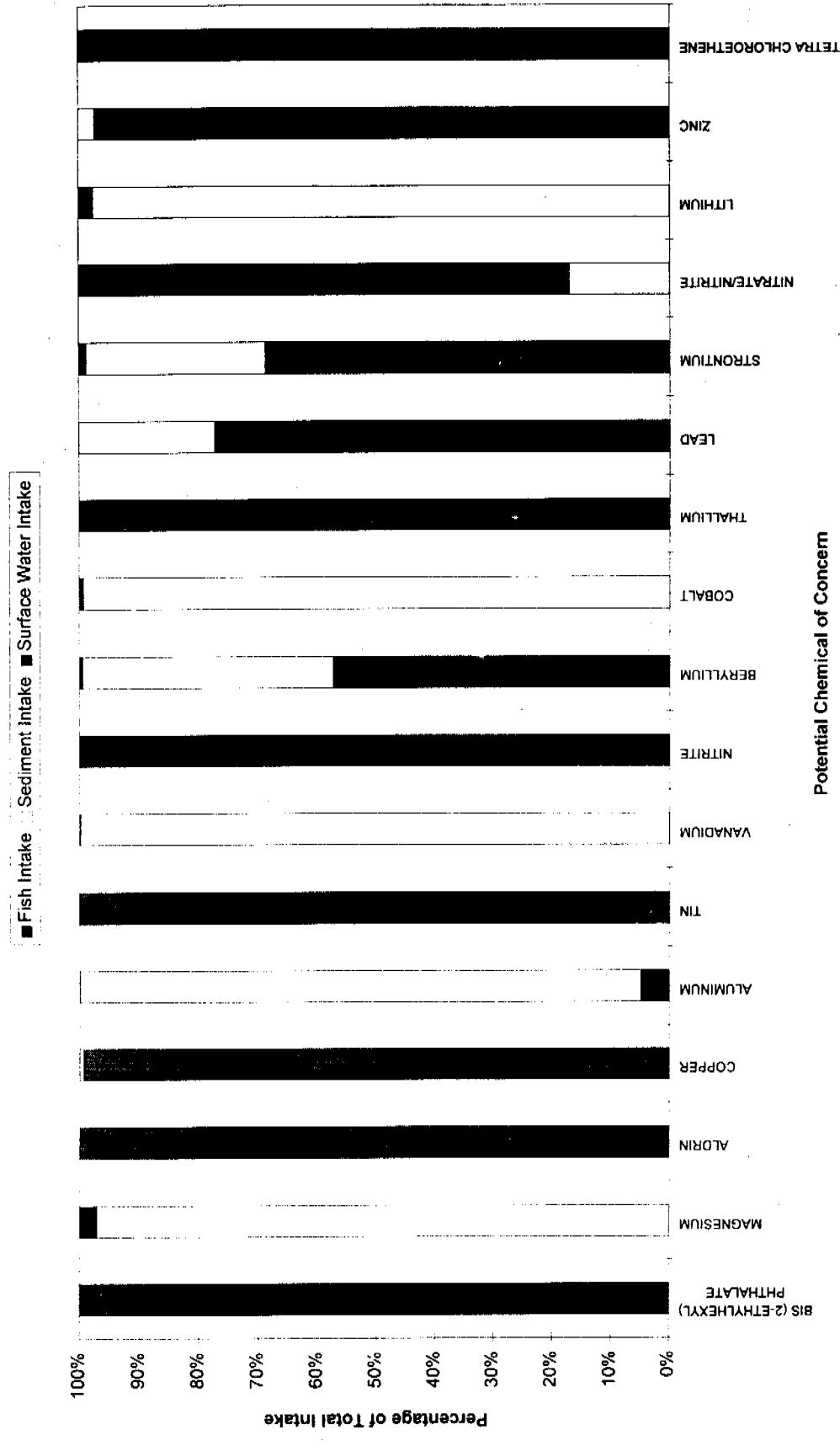


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Great Blue Heron in the 881 Hillside Source Area at RFET's

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Great Blue Heron in the 881 Hillside Source Area at RFETS

GREAT BLUE HERON		EXPOSURE POINT										SUMMARY			
		Fish					Sediment			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
Analyte	PCOC for OU1	IR = 0.2		IR = 0.0036		UCL ₉₅		UCL ₉₅		IR = 0.045		SUF = 1.0	SUF = 1.0	SUF = 1.0	
		Estimated Value	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅				
BIS (2-ETHYLHEXYL) PHthalATE	NR	68.00	13.60	0.35	1.27E-03	0.02	6.79E-04	13.60	0.45	30.23	72.59%				
MAGNESIUM	NR	NO BCF	—	5670.20	20.41	13.58	0.61	21.02	11.21	1.88	4.50%				
ALDRIN	0.39	0.08	ND	—	4.20E-05	1.89E-06	0.08	0.05	1.70	1.70	4.07%				
COPPER	93.33	18.67	36.37	0.13	0.01	4.22E-04	18.80	12.59	1.49	3.59%					
ALUMINUM	NR	14.72	2.94	15760.02	56.74	0.93	0.04	59.72	45.85	1.30	3.13%				
TIN	NR	67.89	13.58	ND	—	0.02	1.07E-03	13.58	15.42	0.88	2.11%				
VANADIUM	NR	NO BCF	—	44.88	0.16	0.01	3.97E-04	0.16	0.23	0.70	1.69%				
NITRITE	NR	—	NR	—	0.13	0.01	0.01	0.01	0.01	0.62	1.49%				
BERYLLIUM	NR	0.02	3.99E-03	0.81	2.91E-03	9.07E-04	4.08E-05	0.01	0.02	0.39	0.94%				
COBALT	NR	NO BCF	—	11.09	0.04	0.01	3.02E-04	0.04	0.11	0.37	0.89%				
THALLIUM	NR	0.08	0.02	ND	—	1.96E-03	8.84E-05	0.02	0.05	0.35	0.85%				
LEAD	1.88	0.38	30.59	0.11	3.47E-03	1.56E-04	0.49	1.44	0.34	0.34	0.81%				
STRONTIUM	NR	5.03	1.01	121.26	0.44	0.41	0.02	1.46	5.29	0.28	0.66%				
NITRATE/NITRITE	NR	NO BCF	—	6.79	0.02	2.62	0.12	0.14	0.75	0.19	0.46%				
LITHIUM	NR	NO BCF	—	10.37	0.04	0.02	9.23E-04	0.04	0.21	0.18	0.44%				
ZINC	121.22	24.24	186.11	0.67	0.05	2.28E-03	24.92	138.68	0.18	0.18	0.43%				
TETRACHLOROETHENE	X	NR	0.64	0.13	ND	—	2.82E-03	1.27E-04	0.13	1.25	0.10	0.24%			
BARIUM	NR	NO BCF	—	180.33	0.65	0.12	0.01	0.65	7.91	0.08	0.20%				
CHROMIUM	ND	—	25.19	0.09	3.95E-03	1.78E-04	0.09	1.55	0.06	0.14%					
MANGANESE	NR	NO BCF	—	335.40	1.21	0.06	2.82E-03	1.21	23.17	0.05	0.13%				
BENZO(a)FLUORANTHENE	X	NR	ND	—	0.39	1.41E-03	ND	—	1.41E-03	0.03	0.05	0.12%			
ARSENIC	NR	0.03	0.01	6.46	0.02	2.04E-03	9.19E-05	0.03	0.69	0.04	0.10%				
PHENANTHRENE	X	NR	ND	—	0.34	1.23E-03	ND	—	1.23E-03	0.03	0.04	0.10%			
ANTIMONY	NR	0.02	3.09E-03	ND	—	0.02	6.89E-04	3.78E-03	0.13	0.03	0.07%				
1,1,1-TRICHLOROETHANE	X	NR	0.12	0.02	ND	—	2.52E-03	1.13E-04	0.02	1.01	0.02	0.06%			
TRICHLOROETHENE	X	NR	0.11	0.02	ND	—	2.58E-03	1.16E-04	0.02	0.99	0.02	0.05%			
SELENIUM	ND	—	0.92	3.31E-03	1.95E-03	8.79E-05	3.40E-03	0.31	0.01	0.03%					
TOLUENE	NR	0.18	0.04	0.01	2.13E-05	2.64E-03	1.19E-04	0.04	3.48	0.01	0.03%				
METHYLENE CHLORIDE	NR	0.02	3.98E-03	ND	—	3.79E-03	1.70E-04	4.15E-03	0.64	0.01	0.02%				
FLUORANTHENE	X	NR	0.77	0.15	14.72	0.05	0.01	3.42E-04	0.21	54.61	<0.01	0.01%			
CHRYSENE	X	NR	ND	—	0.36	1.30E-03	ND	—	1.30E-03	0.29	<0.01	0.01%			
BENZO(b)FLUORANTHENE	X	NR	ND	—	0.34	1.23E-03	ND	—	1.23E-03	0.29	<0.01	0.01%			
PYRENE	X	NR	ND	—	0.32	1.15E-03	ND	—	1.15E-03	0.29	<0.01	0.01%			
NICKEL	NR	0.77	0.15	14.72	0.05	0.01	3.42E-04	0.21	54.61	<0.01	0.01%				
CADMIUM	ND	—	0.83	2.98E-03	1.61E-03	7.24E-05	3.05E-03	1.16	<0.01	0.01	0.01%				
MERCURY	ND	—	ND	—	1.18E-04	5.31E-06	5.31E-06	0.01	<0.01	0.00%					
MOLYBDENUM	NR	NO BCF	—	ND	—	0.02	9.45E-04	9.45E-04	0.93	<0.01	0.00%				
TOTAL XYLIENES	X	NR	0.40	0.08	ND	—	2.51E-03	1.13E-04	0.08	91.70	<0.01	0.00%			
1,2-DICHLOROETHANE	X	NR	0.02	4.17E-03	ND	—	2.66E-03	1.20E-04	4.29E-03	15.07	<0.01	0.00%			
ACETONE	NR	2.73E-03	5.47E-04	0.07	2.65E-04	0.01	3.15E-04	1.13E-03	68.36	<0.01	0.00%				
SILVER	ND	—	ND	—	ND	—	3.41E-03	1.53E-04	861.38	<0.01	0.00%				

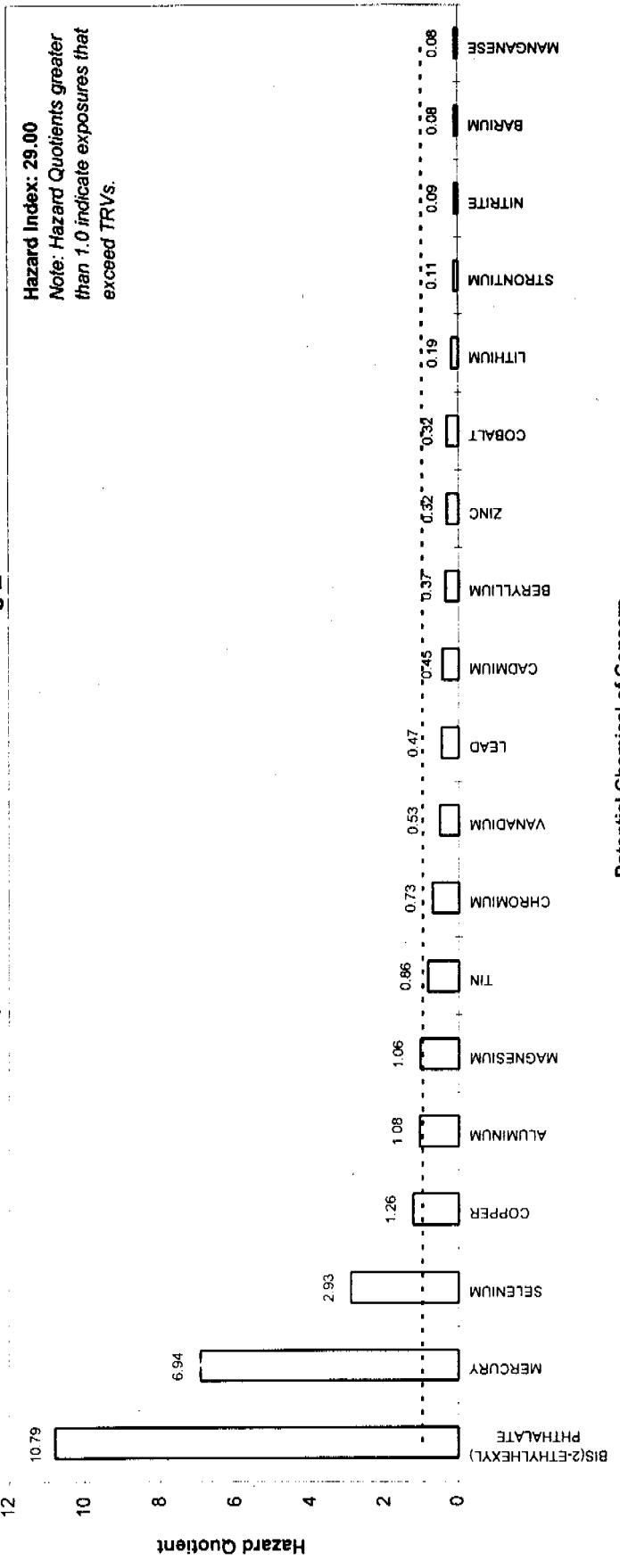
HAZARD INDEX 41.64

Summary of Ecotoxicological Risk to Great Blue Heron in the 881 Hillside Source Area at RFETS

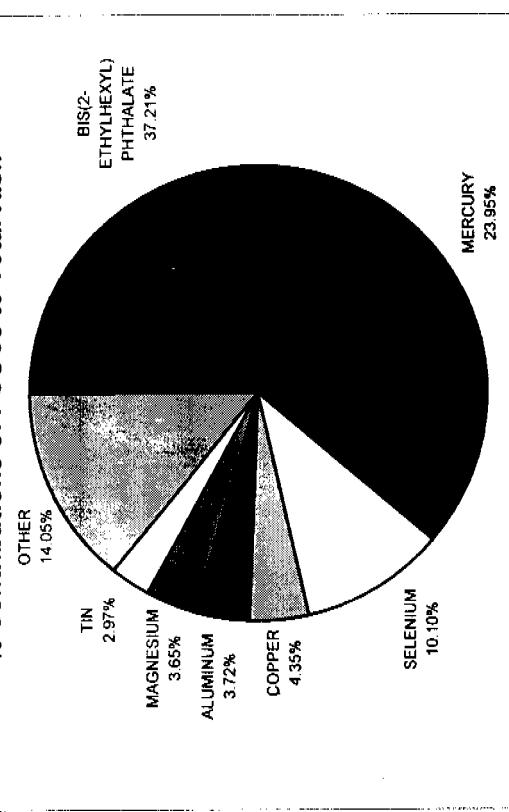
		EXPOSURE POINT						SUMMARY			
		Fish		Sediment		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
GREAT BLUE HERON		Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake				
881 HILLSIDE		UCL ₉₅	IR = 0.2 SUF = 1.0	UCL ₉₅	IR = 0.0036 SUF = 1.0	UCL ₉₅	IR = 0.045 SUF = 1.0	HAZARD INDEX	41.64		
Analyte	PCOC for OU1										

Summary of Ecotoxicological Risk to Great Blue Heron in the C-Ponds Source Area at RFETS

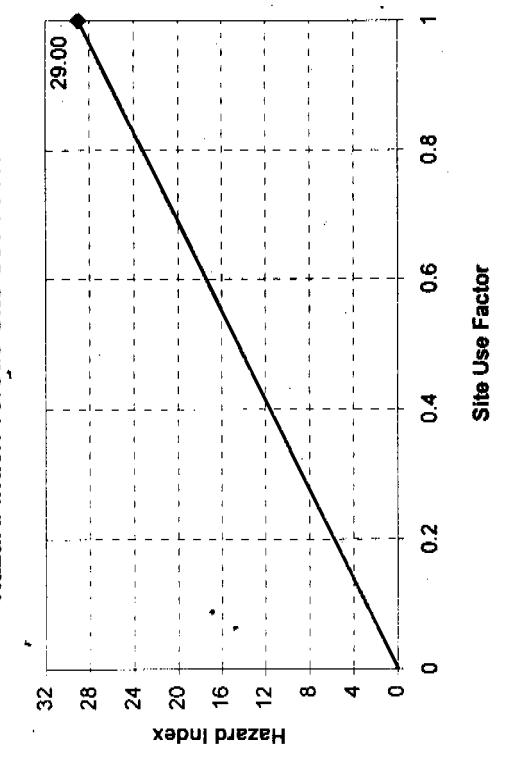
Hazard Quotients for the PCOCs Contributing > 1% of Risk



% Contributions of PCOCs to Total Risk

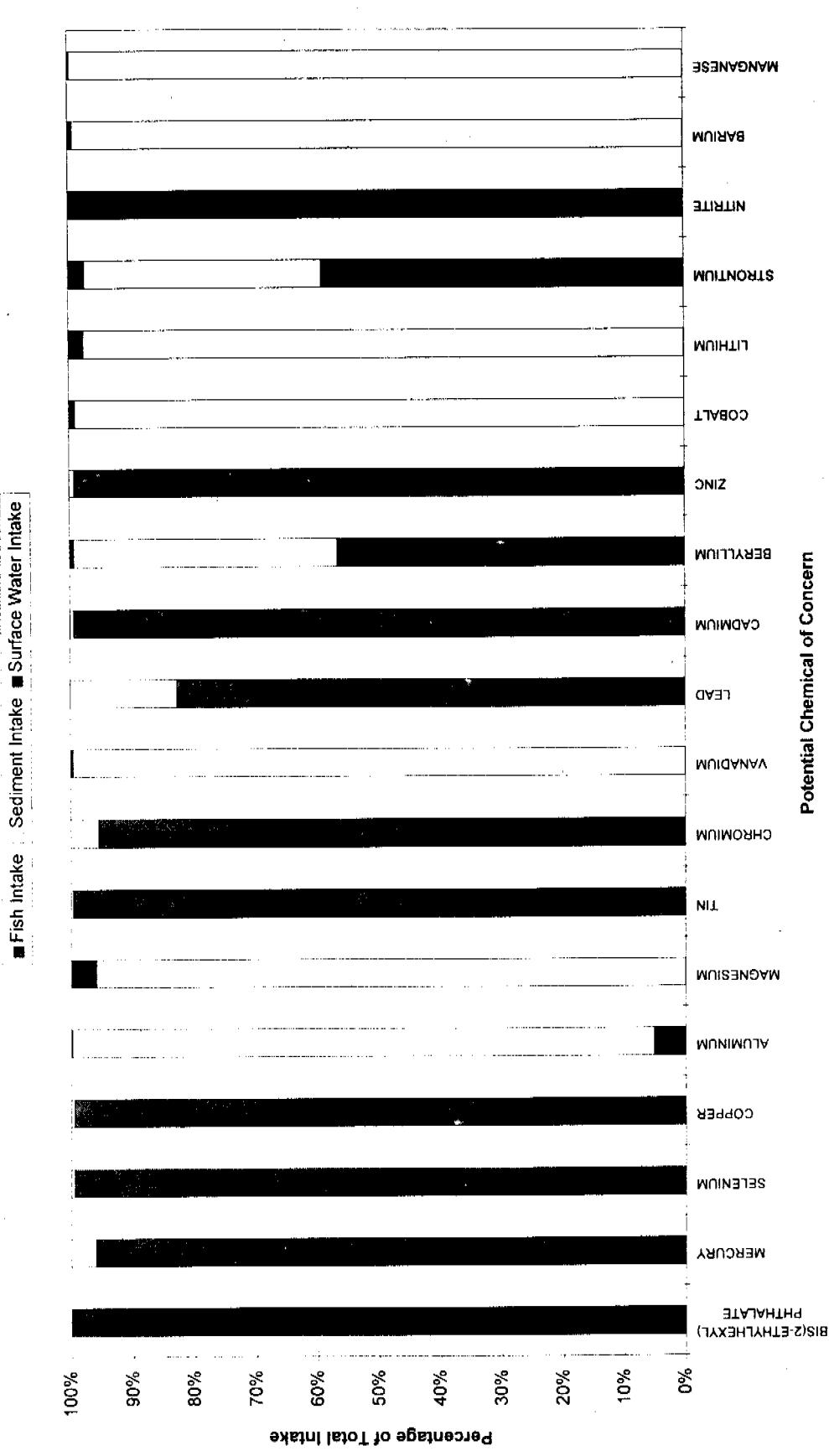


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Great Blue Heron in the C-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake

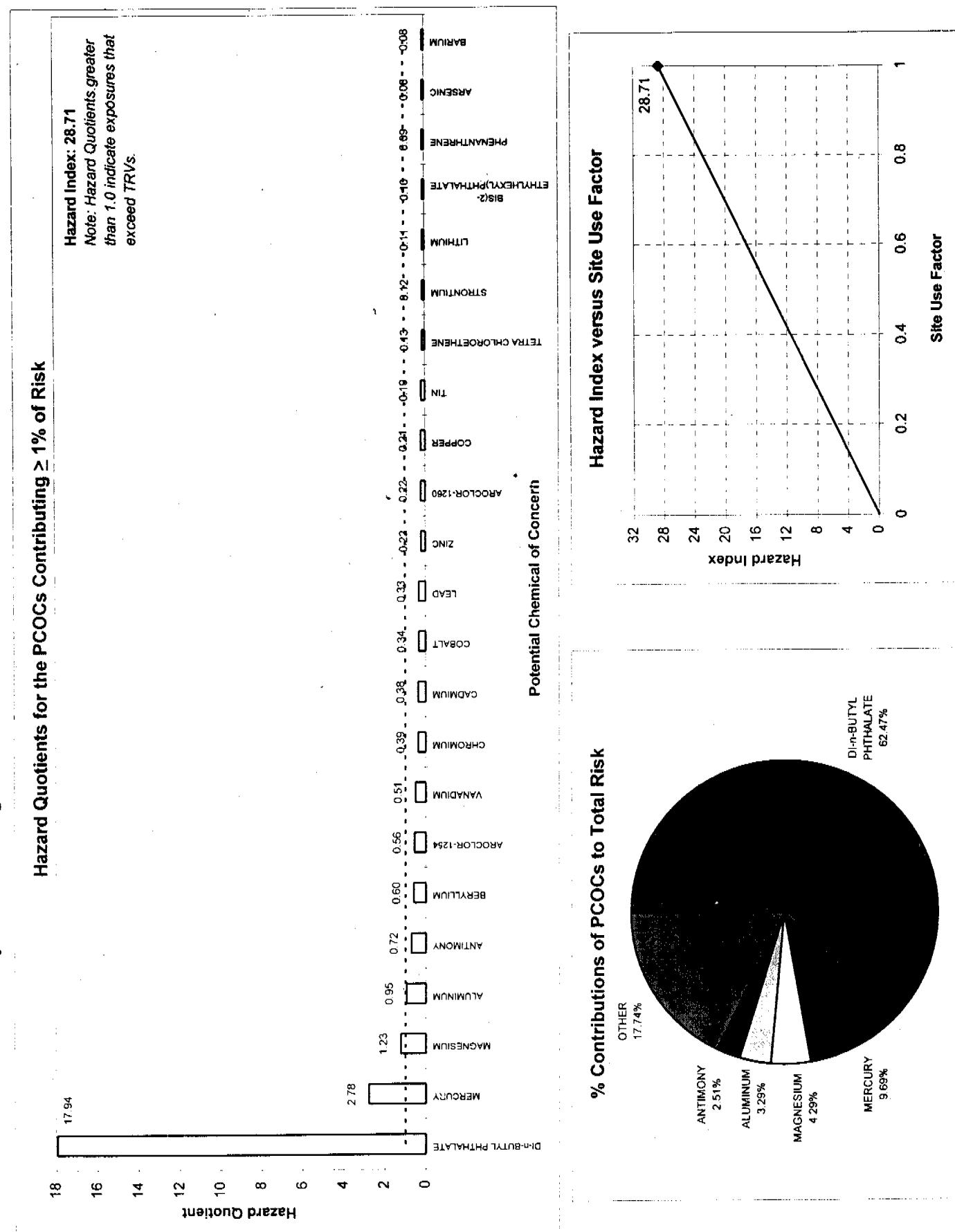


Summary of Ecotoxicological Risk to Great Blue Heron in the C-Ponds Source Area at RFETs

GREAT BLUE HERON C-PONDS		EXPOSURE POINT						SUMMARY			
		Fish		Sediment		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
Analyte	PCOC for OU5	UCL ₉₅ IR = 0.2 SUF = 1.0	Estimated Value	Intake	UCL ₉₅ IR = 0.0036	Intake	UCL ₉₅ IR = 0.045 SUF = 1.0	Intake	Reference Value		
BIS(2-ETHYLHEXYL) PHTHALATE	X	NR	24.26	4.85	0.64	2.30E-03	0.01	2.42E-04	4.86	0.45	10.79
MERCURY	X	0.17	0.03	0.39	1.41E-03	1.41E-04	6.35E-06	0.04	0.01	6.94	37.21%
SELENIUM		4.46	0.89	1.35	4.87E-03	1.85E-03	8.34E-05	0.90	0.31	2.93	23.95%
COPPER	X	78.92	15.78	23.08	0.08	0.01	3.59E-04	15.87	12.59	2.93	10.10%
ALUMINUM		NR	12.74	2.55	13018.07	46.87	2.43	0.11	49.52	45.85	1.26
MAGNESIUM		NR	NO BCF	—	3157.85	11.37	10.77	0.48	11.85	11.21	1.08
TIN		NR	66.24	13.25	12.06	0.04	0.02	9.66E-04	13.29	15.42	1.06
CHROMIUM		5.37	1.07	14.04	0.05	4.76E-03	2.14E-04	1.12	1.55	0.86	3.65%
VANADIUM		NR	NO BCF	—	33.89	0.12	0.01	5.21E-04	0.12	0.23	0.86
LEAD	X	2.82	0.56	32.42	0.12	0.01	2.84E-04	0.68	1.44	0.47	2.97%
CADMIUM		2.60	0.52	0.90	3.23E-03	2.59E-03	1.16E-04	0.52	1.16	0.45	2.51%
BERYLLIUM		NR	0.02	3.69E-03	0.77	2.76E-03	9.99E-04	4.50E-05	0.01	0.02	0.37
ZINC	X	219.88	43.98	94.33	0.34	0.05	2.18E-03	44.32	138.68	0.32	1.84%
COBALT	X	NR	NO BCF	—	9.58	0.03	0.01	3.58E-04	0.03	0.11	1.63%
LITHIUM	X	NR	NO BCF	—	10.54	0.04	0.02	9.32E-04	0.04	0.21	0.45
STRONTIUM	X	NR	1.74	0.35	62.80	0.23	0.34	0.02	0.59	5.29	1.55%
NITRITE		NR	—	ND	—	0.02	8.48E-04	8.48E-04	0.01	0.09	0.37
BARIUM	X	NR	NO BCF	—	177.77	0.64	0.11	4.91E-03	0.64	7.91	1.10%
MANGANESE		NR	NO BCF	—	521.40	1.88	0.12	0.01	1.88	23.17	0.32
THALLIUM		NR	ND	—	0.83	3.00E-03	2.34E-03	1.05E-04	3.11E-03	0.05	1.10%
AROCLOR-1254	X	0.04	0.01	ND	—	ND	—	0.01	0.14	0.05	0.28%
NITRATE/NITRITE		NR	NO BCF	—	3.57	0.01	0.54	0.02	0.04	0.75	0.19
Di-n-BUTYL PHTHALATE	X	NR	ND	—	0.545197	1.96E-03	ND	—	1.96E-03	0.05	0.64%
ANTIMONY	X	NR	0.02	4.00E-03	ND	—	0.02	6.92E-04	4.69E-03	0.13	0.38%
ARSENIC		NR	0.04	0.01	4.89	0.02	2.23E-03	1.00E-04	0.02	0.69	0.32%
MOLYBDENUM		NR	NO BCF	—	4.83	0.02	0.02	1.06E-03	0.02	0.93	0.28%
TOLUENE	X	NR	0.18	0.04	0.15	5.26E-04	2.52E-03	1.13E-04	0.04	3.48	0.17%
FLUORANTHENE	X	NR	ND	—	0.54	1.93E-03	ND	—	1.93E-03	0.05	0.07
METHYLENE CHLORIDE	X	NR	0.02	3.85E-03	0.02	7.15E-05	3.67E-03	1.65E-04	4.08E-03	0.04	0.23%
NICKEL		NR	0.89	0.18	15.65	0.06	0.01	3.91E-04	0.23	54.61	0.12%
delta-BHC		NR	ND	—	0.02	7.93E-05	ND	—	7.93E-05	0.02	0.07%
PHENOL	X	NR	ND	—	0.54	1.93E-03	ND	—	1.93E-03	0.23	<0.01%
ACETONE		NR	0.01	1.13E-03	0.12	4.47E-04	0.01	6.51E-04	2.23E-03	0.01	<0.01%
BUTYL BENZYL PHTHALATE	X	NR	ND	—	0.55	1.99E-03	ND	—	1.99E-03	68.36	<0.01%
1,1,1-TRICHLOROETHANE		NR	ND	—	0.01	2.14E-05	ND	—	2.14E-05	84.66	<0.01%
SILVER	X	ND	—	2.33	0.01	3.60E-03	1.62E-04	0.01	861.38	<0.01	<0.01%

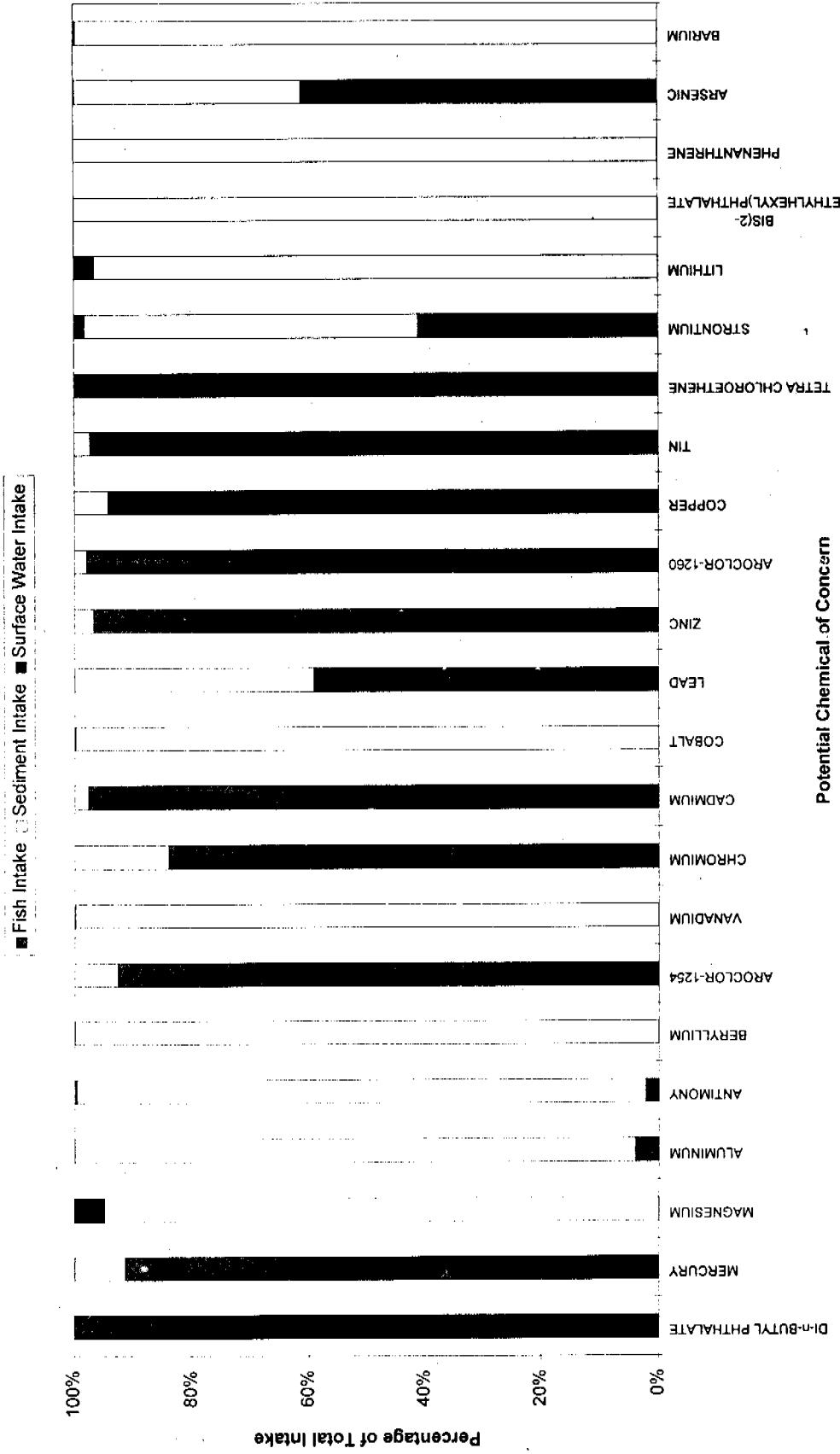
HAZARD INDEX **29.00**

Summary of Ecotoxicological Risk to Great Blue Heron in the B-Ponds Source Area at RFETS



Summary of Ecotoxicological Risk to Great Blue Heron in the B-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Great Blue Heron in the B-Ponds Source Area at RFETs

GREAT BLUE HERON B-PONDS		EXPOSURE POINT						SUMMARY			
		Fish		Sediment		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
Analyte	PCOC for OU6	IR = 0.2 SUF = 1.0	UCL ₉₅	Estimated Value	Intake	IR = 0.0036 SUF = 1.0	UCL ₉₅	Intake	IR = 0.045 SUF = 1.0		
DI-n-BUTYL PHthalATE	X	NR	4.03	0.81	ND	—	4.98E-03	2.24E-04	0.81	0.05	17.94 62.47%
MERCURY	X	0.07	0.01	0.34	1.22E-03	2.75E-04	1.24E-05	0.01	0.01	2.78	9.69%
MAGNESIUM	X	NR	NO BCF	—	3643.65	13.12	15.50	0.70	13.81	11.21	1.23 4.29%
ALUMINUM	X	NR	8.60	1.72	11556.25	41.60	0.26	0.01	43.34	45.85	0.95 3.29%
ANTIMONY	X	NR	0.01	2.05E-03	25.42	0.09	0.01	3.83E-04	0.09	0.13	0.72 2.51%
BERYLLIUM	X	ND	—	2.93	0.01	1.79E-04	8.06E-06	0.01	0.02	0.60	2.08%
AROCLOR-1254	X	0.35	0.07	1.54	0.01	NR	—	0.08	0.14	0.56	1.96%
VANADIUM	X	NR	NO BCF	—	32.78	0.12	2.85E-03	1.28E-04	0.12	0.23	0.51 1.79%
CHROMIUM	X	2.51	0.50	26.37	0.09	2.21E-03	9.95E-05	0.60	1.55	0.39	1.34%
CADMIUM	X	2.18	0.44	2.89	0.01	9.86E-04	4.44E-05	0.45	1.16	0.38	1.33%
COBALT	X	NR	NO BCF	—	10.13	0.04	1.58E-03	7.12E-05	0.04	0.11	0.34 1.17%
LEAD	X	1.43	0.29	54.43	0.20	0.01	2.31E-04	0.48	1.44	0.33	1.17%
ZINC	X	148.42	29.68	279.26	1.01	0.03	1.17E-03	30.69	138.68	0.22	0.77%
AROCLOR-1260	X	0.14	0.03	0.17	5.97E-04	NR	—	0.03	0.14	0.22	0.75%
COPPER	X	12.59	2.52	42.04	0.15	ND	—	2.67	12.59	0.21	0.74%
TIN	X	NR	13.94	2.79	21.23	0.08	0.01	2.85E-04	2.86	15.42	0.19 0.65%
TETRA CHLOROETHENE	X	NR	0.83	0.17	ND	—	3.66E-03	1.65E-04	0.17	1.25	0.13 0.46%
STRONTIUM	X	NR	1.32	0.26	101.26	0.36	0.26	0.01	0.64	5.29	0.12 0.42%
LITHIUM	X	NR	NO BCF	—	6.20	0.02	0.02	7.79E-04	0.02	0.21	0.11 0.38%
BIS(2-ETHYLHEXYL)PHthalATE	X	NR	ND	—	12.83	0.05	ND	—	0.05	0.45	0.10 0.36%
PHENANTHRENE	X	NR	ND	—	0.74	2.68E-03	ND	—	2.68E-03	0.03	0.09 0.32%
ARSENIC	X	0.18	0.04	6.29	0.02	2.25E-03	1.01E-04	0.06	0.69	0.08	0.30% 0.28%
BARIUM	X	NR	NO BCF	—	178.74	0.64	0.05	2.32E-03	0.65	7.91	0.08 0.28%
THALLIUM	X	NR	ND	—	0.95	3.41E-03	ND	—	3.41E-03	0.05	0.07 0.26%
ANTHRACENE	X	NR	ND	—	0.33	1.17E-03	ND	—	1.17E-03	0.02	0.05 0.18%
BENZO(k)FLUORANTHENE	X	NR	ND	—	0.41	1.48E-03	ND	—	1.48E-03	0.03	0.05 0.18%
BENZO(a)PYRENE	X	NR	ND	—	0.40	1.43E-03	ND	—	1.43E-03	0.03	0.05 0.17%
DIBENZO(a,h)ANTHRACENE	X	NR	ND	—	0.35	1.24E-03	ND	—	1.24E-03	0.03	0.04 0.15%
MANGANESE	X	NR	NO BCF	—	272.52	0.98	0.10	4.41E-03	0.99	23.17	0.04 0.15%
TRICHLOROETHENE	X	NR	0.12	0.02	ND	—	2.88E-03	1.29E-04	0.02	0.99	0.02 0.08%
INDENO(1,2,3-cd)PYRENE	X	NR	ND	—	0.35	1.26E-03	ND	—	1.26E-03	0.07	0.02 0.06%
FLUORANTHENE	X	NR	ND	—	1.13	4.06E-03	ND	—	4.06E-03	0.29	0.01 0.05%
PYRENE	X	NR	ND	—	0.95	3.42E-03	ND	—	3.42E-03	0.29	0.01 0.04%
BENZO(b)FLUORANTHENE	X	NR	ND	—	0.35	1.26E-03	ND	—	1.26E-03	0.29	<0.01 0.02%
CHRYSENE	X	NR	ND	—	0.85	3.07E-03	ND	—	3.07E-03	0.29	0.01 0.04%
SELENIUM	X	NR	ND	—	0.61	2.21E-03	ND	—	2.21E-03	0.29	0.01 0.03%
BENZO(a)ANTHRACENE	X	NR	ND	—	0.59	2.13E-03	2.02E-03	9.10E-05	2.22E-03	0.31	0.01 0.03%
FLUORENE	X	NR	ND	—	0.43	1.54E-03	ND	—	1.54E-03	0.29	0.01 0.02%
BENZO(g,h)PERYLENE	X	NR	ND	—	0.35	1.26E-03	ND	—	1.26E-03	0.29	<0.01 0.02%
NICKEL	X	ND	—	0.35	1.24E-03	ND	—	1.24E-03	0.29	<0.01 0.01%	
SILVER	X	0.51	92.07	0.33	ND	—	0.84	1.60E-04	0.07	54.61	<0.01 <0.01%
HEPTACHLOR	X	ND	—	0.01	2.44E-05	NR	—	2.44E-05	0.03	861.38	<0.01 <0.01%
											<0.01 <0.01%

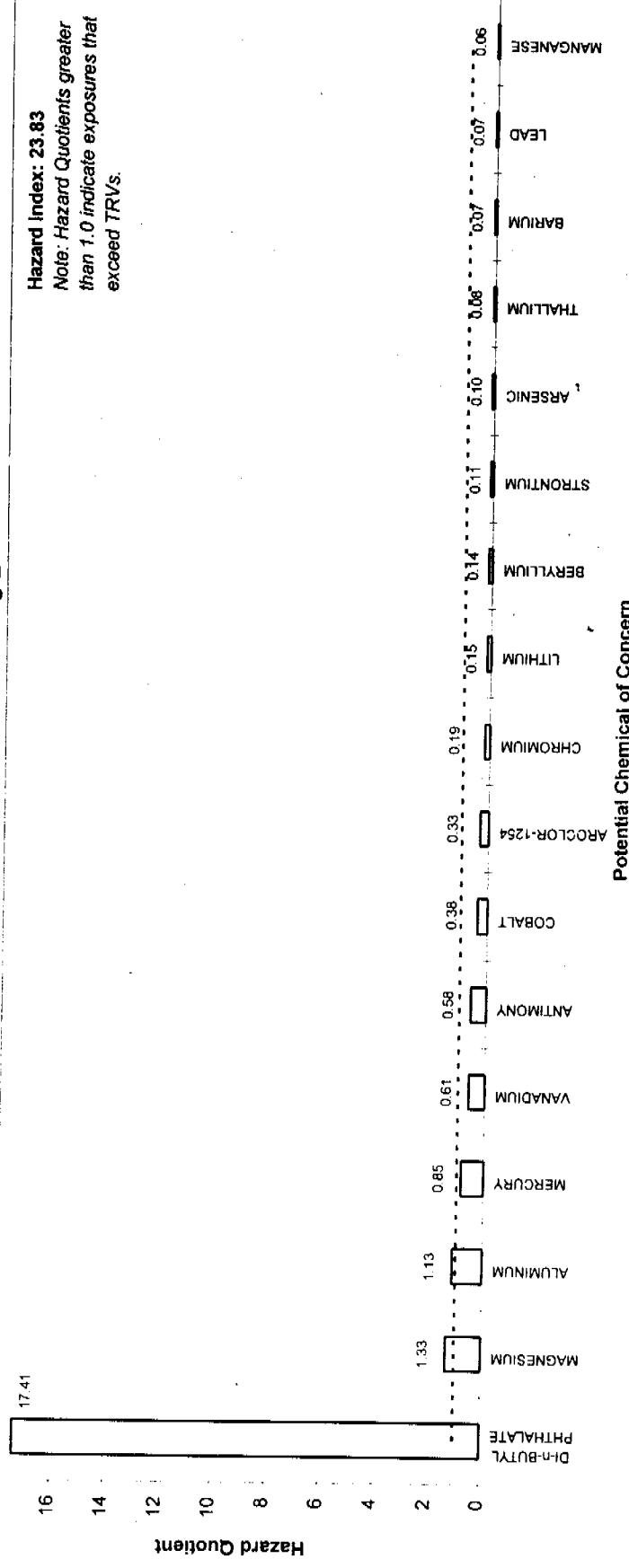
Summary of Ecotoxicological Risk to Great Blue Heron in the B-Ponds Source Area at RFETS

GREAT BLUE HERON B-PONDS		EXPOSURE POINT						SUMMARY				
		Fish			Sediment			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient
Analyte	PCOC for OU6	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	IR = 0.0036	SUF = 1.0	IR = 0.045	SUF = 1.0
MOLYBDENUM	X	NR	NO BCF	—	ND	—	0.01	3.31E-04	3.31E-04	0.93	<0.01	<0.01%
TOLUENE	X	NR	ND	—	0.28	1.00E-03	ND	—	1.00E-03	3.48	<0.01	<0.01%
1,2-DICHLOROETHANE	X	NR	0.02	3.99E-03	ND	—	2.54E-03	1.14E-04	4.10E-03	15.07	<0.01	<0.01%
PHENOL	X	NR	ND	—	0.34	1.22E-03	ND	—	1.22E-03	15.50	<0.01	<0.01%
METHYLENE CHLORIDE	X	NR	ND	—	0.01	3.38E-05	ND	—	3.38E-05	0.64	<0.01	<0.01%
NAPHTHALENE	X	NR	ND	—	0.35	1.26E-03	ND	—	1.26E-03	29.01	<0.01	<0.01%
ACENAPHTHENE	X	NR	ND	—	0.34	1.23E-03	ND*	—	1.23E-03	29.01	<0.01	<0.01%
2-METHYLNAPHTHALENE	X	NR	ND	—	0.34	1.23E-03	ND	—	1.23E-03	29.01	<0.01	<0.01%
Di-n-Octyl PHthalate	X	NR	ND	—	0.33	1.20E-03	ND	—	1.20E-03	36.99	<0.01	<0.01%
ACETONE	X	NR	4.12E-03	8.25E-04	0.19	6.83E-04	0.01	4.76E-04	1.98E-03	68.36	<0.01	<0.01%
BUTYL BENZYL PHthalate	X	NR	ND	—	0.34	1.23E-03	ND	—	1.23E-03	84.66	<0.01	<0.01%
gamma-BHC (LINDANE)	X	ND	—	0.01	2.08E-05	NR	—	2.08E-05	1.50	<0.01	<0.01	<0.01%

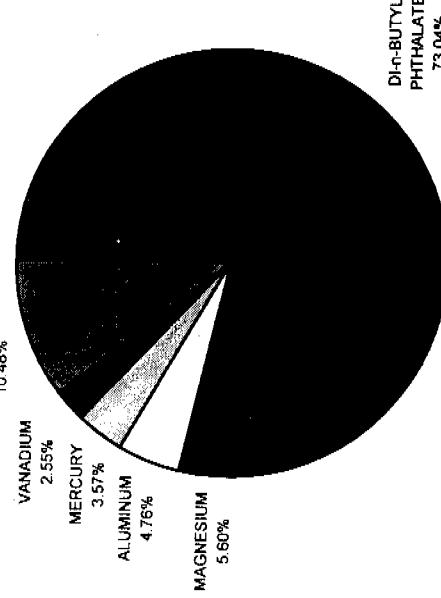
HAZARD INDEX 28.71

Summary of Ecotoxicological Risk to Great Blue Heron in the A-Ponds Source Area

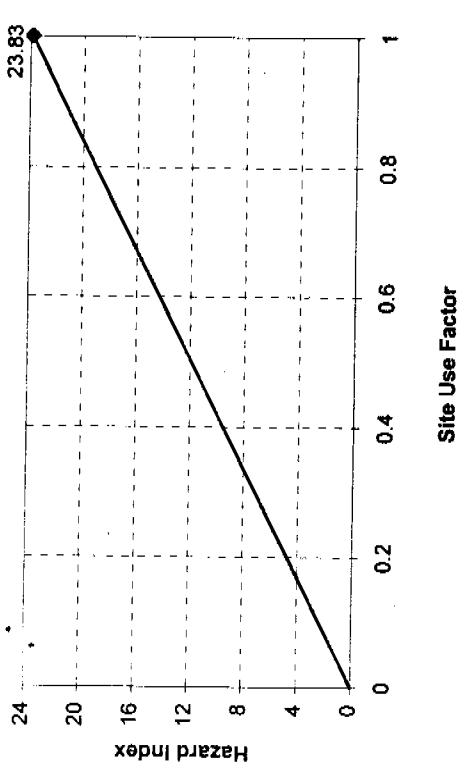
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

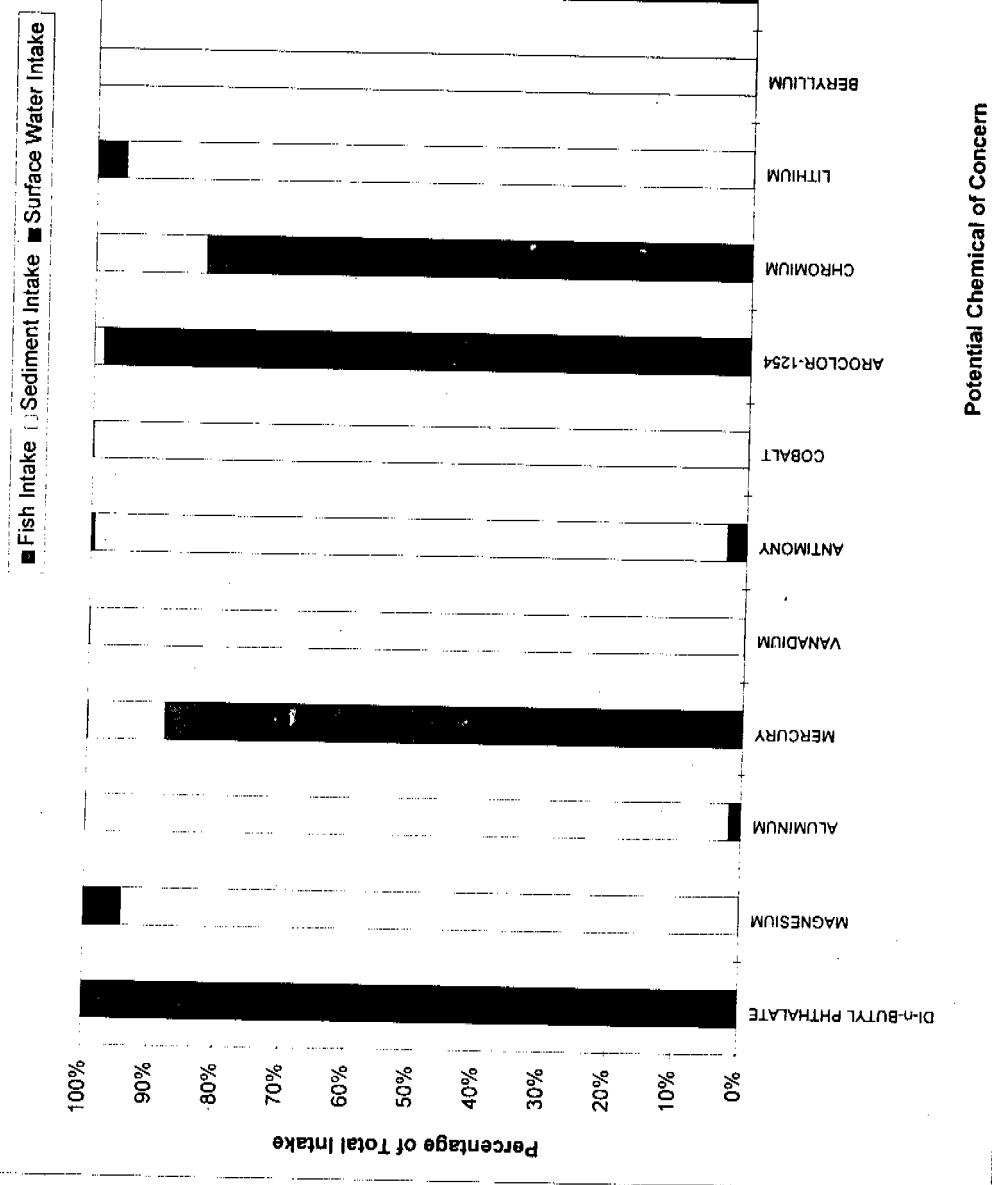


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Great Blue Heron in the A-Ponds Source Area

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Great Blue Heron in the A-Ponds Source Area

GREAT BLUE HERON A-PONDS		EXPOSURE POINT						SUMMARY					
		Fish			Sediment			Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
Analyte	PCOC for this OU6	UCI ₉₅ IR = 0.2 FI = 1.0	Estimated Value	Intake	UCI ₉₅ IR = 0.0036 FI = 1.0	Intake	UCI ₉₅ IR = 0.045 FI = 1.0	Intake	Reference Value				
Di-n-BUTYL PHTHALATE	X	NR	3.92	0.78	ND	—	0.00	2.17E-04	0.78	0.05	17.41	73.04%	
MAGNESIUM	X	NR	NO BCF	—	3921.00	14.12	18.85	0.85	14.96	11.21	1.33	5.60%	
ALUMINUM		NR	4.70	0.94	14176.39	51.03	0.41	0.02	51.99	45.85	1.13	4.76%	
MERCURY	X	0.02	3.85E-03	0.14	5.10E-04	0.00	6.71E-06	4.37E-03	0.01	0.85	0.23	3.57%	
VANADIUM	X	NR	NO BCF	—	38.87	0.14	0.00	1.03E-04	0.14	0.23	0.61	2.55%	
ANTIMONY	X	NR	0.01	2.24E-03	20.23	0.07	0.01	3.98E-04	0.08	0.13	0.58	2.43%	
COBALT	X	NR	NO BCF	—	11.59	0.04	0.00	6.57E-05	0.04	0.11	0.38	1.61%	
AROCLOR-1254	X	0.22		0.04	0.18	6.55E-04	NR	—	0.04	0.14	0.33	1.38%	
CHROMIUM	X	1.24		0.25	13.99	0.05	0.00	7.34E-05	0.30	1.55	0.19	0.81%	
LITHIUM		NR	NO BCF	—	8.27	0.03	0.03	1.38E-03	0.03	0.21	0.15	0.62%	
BERYLLIUM		ND	—	0.71	2.56E-03	ND	—	2.56E-03	0.02	0.14	0.14	0.61%	
STRONTIUM	X	NR	1.41	0.28	73.12	0.26	0.28	0.01	0.56	5.29	0.11	0.44%	
ARSENIC	X	0.23		0.05	6.35	0.02	3.55E-03	1.60E-04	0.07	0.69	0.10	0.42%	
THALLIUM		NR	ND	—	0.98	3.52E-03	ND	—	3.52E-03	0.05	0.08	0.32%	
BARIUM	X	NR	NO BCF	—	163.38	0.59	0.06	2.79E-03	0.59	7.91	0.07	0.31%	
LEAD	X	ND	—	—	26.60	0.10	3.32E-03	1.49E-04	0.10	1.44	0.07	0.28%	
MANGANESE	X	NR	NO BCF	—	362.37	1.30	0.18	0.01	1.31	23.17	0.06	0.24%	
ANTHRACENE	X	NR	ND	—	0.29	1.36E-03	ND	—	1.06E-03	0.02	0.05	0.20%	
PHENANTHRENE	X	NR	ND	—	0.31	1.12E-03	ND	—	1.12E-03	0.03	0.04	0.16%	
BENZOK(FLUORANTHENE	X	NR	ND	—	0.28	1.02E-03	ND	—	1.02E-03	0.03	0.04	0.15%	
BENZO(a)PYRENE	X	NR	ND	—	0.28	1.01E-03	ND	—	1.01E-03	0.03	0.03	0.15%	
INDENO(1,2,3-cd)PYRENE	X	NR	ND	—	0.29	1.04E-03	ND	—	1.04E-03	0.07	0.01	0.06%	
NICKEL	X	2.53	0.51	17.82	0.06	2.78E-03	1.25E-04	0.57	54.61	0.01	0.04%	0.04%	
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	ND	—	1.24	4.47E-03	ND	—	4.47E-03	0.45	0.01	0.04%	
SELENIUM	ND	—	0.64	2.31E-03	3.28E-03	1.48E-04	2.45E-03	0.31	0.01	0.03%			
COPPER	X	ND	—	22.16	0.08	2.10E-03	9.44E-05	0.08	12.59	0.01	0.03%		
FLUORANTHENE	X	NR	ND	—	0.41	1.46E-03	ND	—	1.46E-03	0.29	0.01	0.02%	
METHYLENE CHLORIDE	X	NR	0.02	3.08E-03	ND	—	2.94E-03	1.32E-04	3.22E-03	0.64	0.01	0.02%	
PYRENE	X	NR	ND	—	0.34	1.23E-03	ND	—	1.23E-03	0.29	<0.01	0.01%	
BENZO(b)FLUORANTHENE	X	NR	ND	—	0.31	1.12E-03	ND	—	1.12E-03	0.29	<0.01	0.02%	
BENZO(gi)PERYLENE	X	NR	ND	—	0.29	1.04E-03	ND	—	1.04E-03	0.29	<0.01	0.02%	
BENZO(a)ANTHRACENE	X	NR	ND	—	0.28	1.02E-03	ND	—	1.02E-03	0.29	<0.01	0.01%	
ZINC	X	ND	—	10.56	0.47	0.01	3.70E-04	0.47	138.68	<0.01	0.01%		
CHRYSENE	X	NR	ND	—	0.27	9.65E-04	ND	—	9.65E-04	0.29	<0.01	0.01%	
CADMUM		ND	—	0.95	3.40E-03	9.62E-04	4.33E-05	3.45E-03	1.16	<0.01	0.01%		
ALDRIN	X	ND	—	0.01	3.32E-05	NR	—	3.32E-05	0.05	<0.01	<0.01%		
TOLUENE	X	NR	ND	—	0.18	6.40E-04	ND	—	6.40E-04	3.48	<0.01	<0.01%	
MOLYBDENUM	X	0.39	0.08	ND	—	3.08E-03	1.38E-04	1.38E-04	0.93	<0.01	<0.01%		
SILVER	X	NR	ND	—	0.30	1.08E-03	ND	—	8.38E-05	0.08	861.38	<0.01	
PHENOL	X	NR	ND	—	0.09	3.28E-04	ND	—	1.08E-03	15.50	<0.01	<0.01%	
BENZENE	X	NR	ND	—	0.09	3.28E-04	ND	—	3.28E-04	6.66	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Great Blue Heron in the A-Ponds Source Area

GREAT BLUE HERON A-PONDS		EXPOSURE POINT						SUMMARY			
		Fish		Sediment		Surface Water		Total Intake	Toxicity Reference Value	Hazard Quotient	Proportion of Total Risk
Analyte	UCI ₉₅	Estimated Value	Intake	UCI ₉₅	Intake	UCI ₉₅	Intake	UCI ₉₅	Intake	IR = 0.045	IR = 0.045
ACENAPHTHENONE	X	NR	ND	—	0.30	1.08E-03	ND	—	1.08E-03	29.01	<0.01 <0.01%
Di-n-Octyl PHthalate	X	NR	ND	—	0.29	1.06E-03	ND	—	1.06E-03	36.99	<0.01 <0.01%
ACETONE	X	NR	ND	—	0.23	8.27E-04	ND	—	8.27E-04	68.36	<0.01 <0.01%

HAZARD INDEX 23.83

SUMMARY OF ECOLOGICAL RISK TO MALLARDS

ERA source areas evaluated: A-Ponds
 B-Ponds
 C-Ponds

Exposure Points: Aquatic invertebrates
 Vegetation
 Surface water
 Sediment
 Surface soil

Highest risk source area: A-Ponds (HI = 4.5)

PCOCs with HQ > 10: none

Key uncertainties in exposure and risk estimate:

- Concentration of di-n-butyl-phthalate in prey was not measured. Tissue concentrations were estimated from surface water data, BCFs based on K_{ow} , and assume no metabolism.
- Data on PCB and pesticide concentrations in invertebrate and fish tissue are available, but transfer of other semi-volatile organic PCOCs from sediments to fish was not estimated.
- Little surface soil data for pond source areas was available

JK
CMB
JW

SUMMARY OF ECOLOGICAL RISK TO
MALLARDS
(continued)

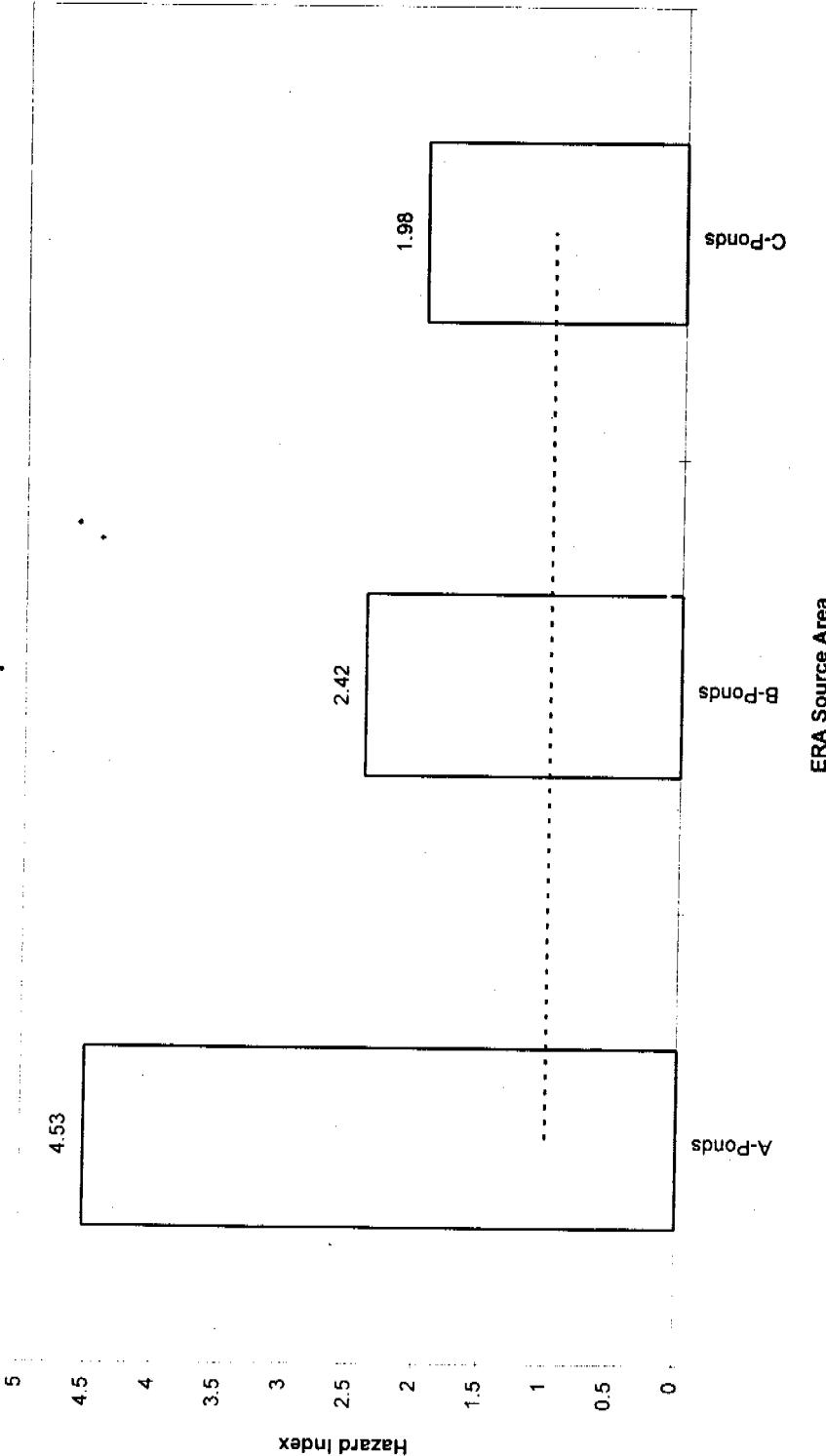
Suggested further action:

ECOCs: di-n-butyl-phthalate in surface water
PCBs in sediments
PAHs in sediments

1. Evaluate phthalate sources in areas with HQ > 1. Identify sample locations and assess risk contribution from stream segments and ponds
2. Evaluate potential bioaccumulation of PAHs from sediments in aquatic prey
3. Assess PAH and PCB risk contribution from stream segments and ponds
4. Conduct more intensive exposure analysis including:
 - distribution of PCBs and PAHs among ponds and sediment depths
 - seasonal exposure patterns
 - potential effects on local populations
 - incidental ingestion of dry sediments at pond margins

Summary of Ecotoxicological Risk to Mallards at RFETS

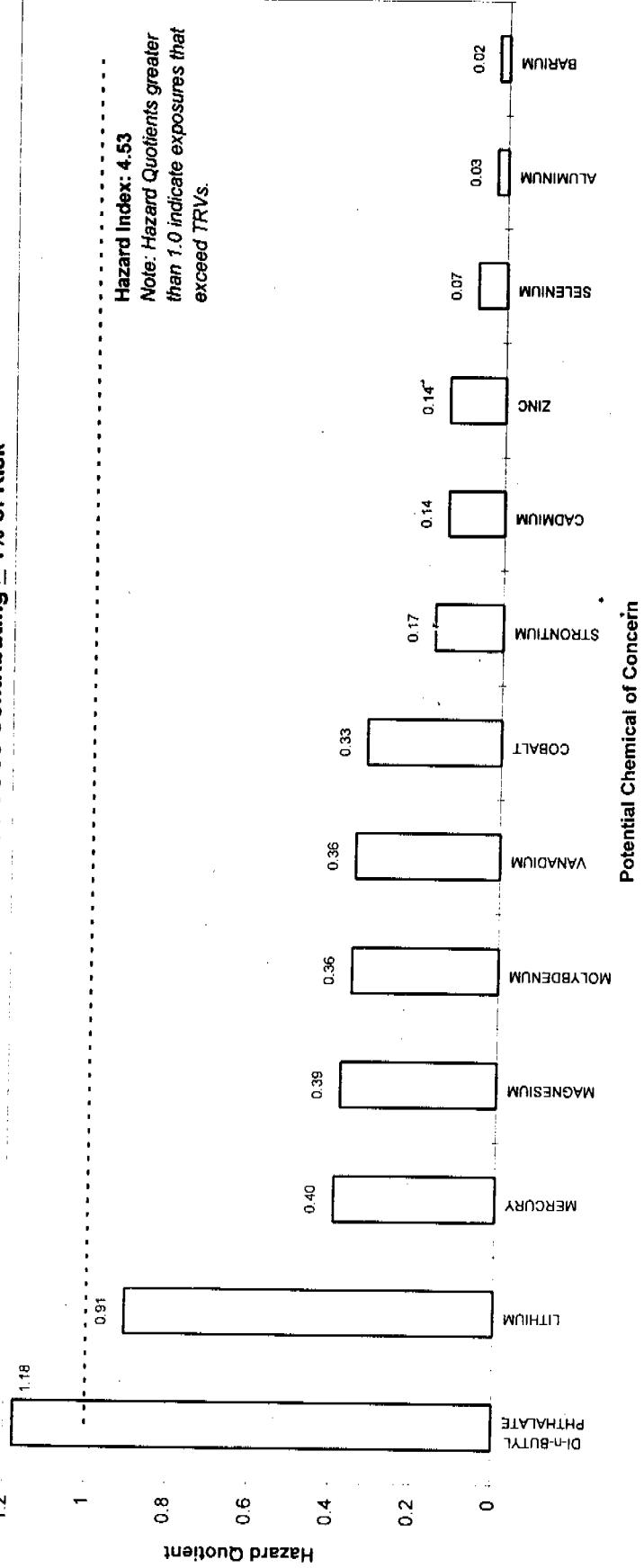
Contribution of ERA Source Areas to Mallards Risk of Toxic Exposure



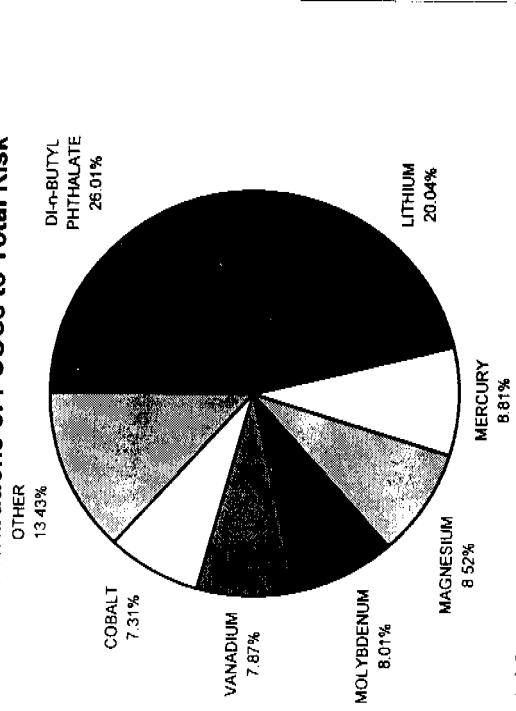
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Summary of Ecotoxicological Risk to Mallards in the A-Ponds Source Area at RFETS

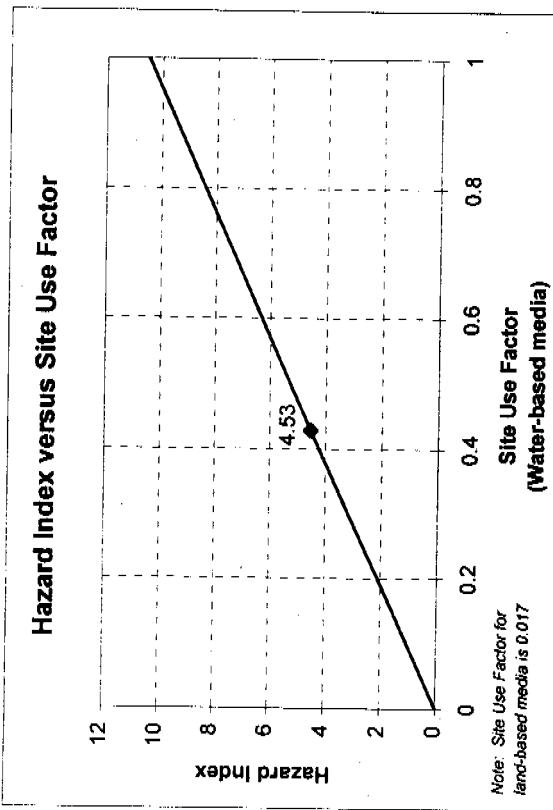
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

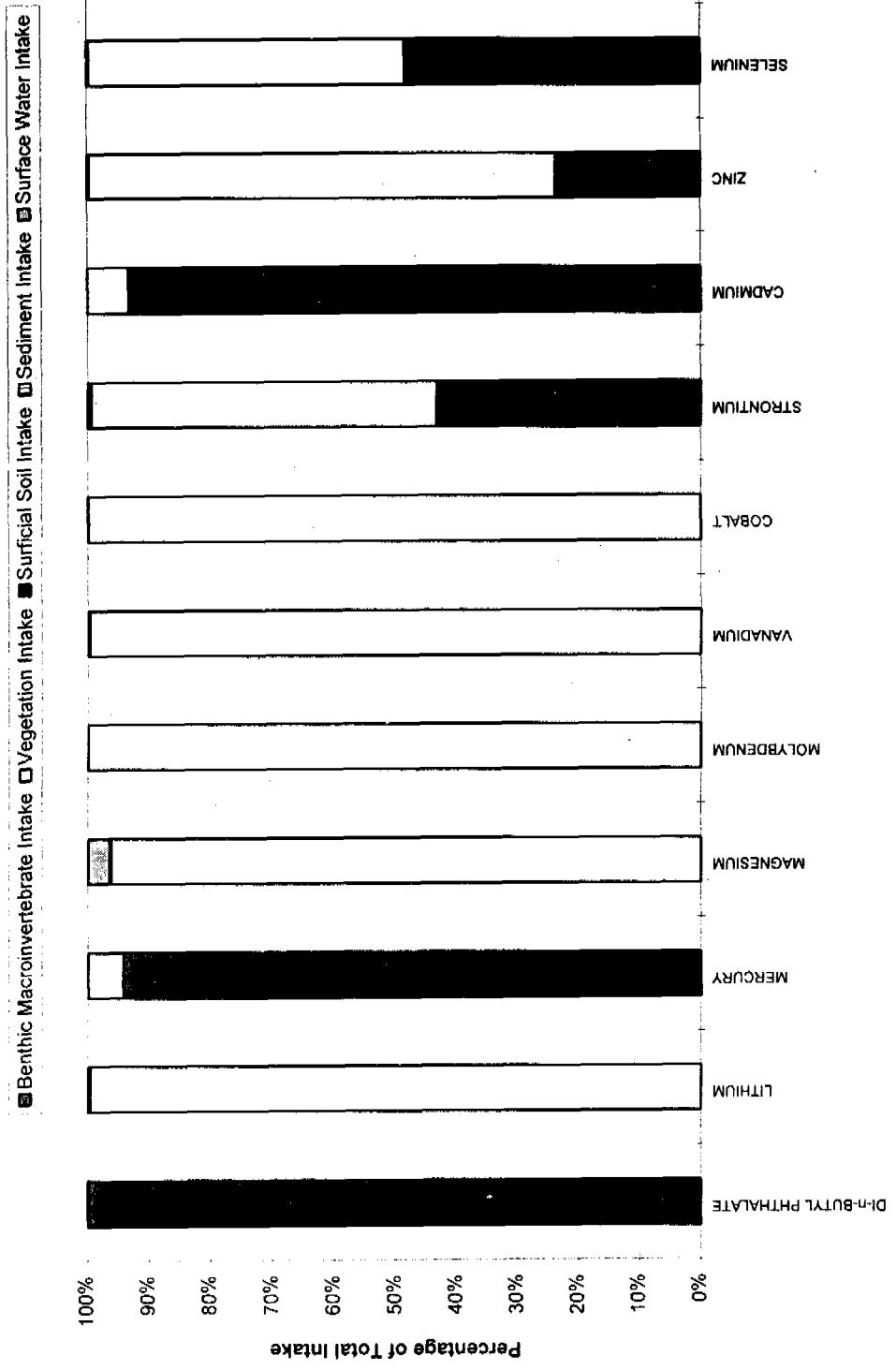


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Mallards in the A-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



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Summary of Ecotoxicological Risk to Mallards in the A-Ponds Source Area at RFETS

MALLARD A-PONDS		EXPOSURE POINT													
		Benthic Macroinvertebrates				Vegetation				Surficial Soil					
Analyte	PCOC for OU6	IR = 0.04 SUF = 0.428	UCI ₉₅ Estimated Value	Intake	UCI ₉₅ SUF = 0.428	UCI ₉₅ Estimated Value	Intake	UCI ₉₅ SUF = 0.017	IR = 0.00052 SUF = 0.017	UCI ₉₅ Intake	IR = 0.0005 SUF = 0.017	UCI ₉₅ Intake	IR = 0.056 SUF = 0.428	UCI ₉₅ Intake	IR = 0.16E-03 SUF = 0.428
Di-n-BUTYL PHTHALATE	X	NR	3.92	0.07	NR	ND	—	ND	—	ND	—	ND	—	4.83E-03	1.16E-04
LITHIUM	X	NR	NO BCF	—	37.90	0.21	NC	—	8.27	7.03E-06	0.03	7.33E-04	—	—	—
MERCURY	X	NR	0.53	0.01	0.10	5.48E-04	ND	—	0.14	1.20E-06	1.49E-04	3.57E-06	—	—	—
MAGNESIUM	X	NR	NO BCF	—	2252.60	12.53	NC	—	3921.00	0.03	18.85	0.45	—	—	—
MOLYBDENUM	X	NR	NO BCF	—	95.43	0.53	NC	—	ND	—	3.08E-03	7.38E-05	—	—	—
VANADIUM	X	NR	NO BCF	—	21.79	0.12	NC	—	38.87	3.30E-04	2.30E-03	5.50E-05	—	—	—
COBALT	X	NR	NO BCF	—	25.99	0.14	NC	—	11.59	9.85E-05	1.46E-03	3.50E-05	—	—	—
STRONTIUM	X	NR	28.27	0.48	112.50	0.63	NC	—	73.12	6.22E-04	0.28	6.66E-03	—	—	—
CADMUM	X	NR	11.07	0.19	2.44	0.01	NC	—	0.95	8.03E-06	9.62E-04	2.31E-05	—	—	—
ZINC	X	NR	5.80	0.10	57.29	0.32	NC	—	130.56	1.11E-03	0.01	1.97E-04	—	—	—
SELENIUM	X	NR	0.77	0.01	2.52	0.01	ND	—	0.64	5.44E-06	3.28E-03	7.87E-05	—	—	—
ALUMINUM	X	NR	4.70	0.08	238.69	1.33	NC	—	14176.39	0.12	0.41	9.71E-03	—	—	—
BARIUM	X	NR	NO BCF	—	40.57	0.23	NC	—	163.38	1.39E-03	0.06	1.48E-03	—	—	—
COPPER	X	NR	0.42	0.01	24.12	0.13	NC	—	22.16	1.88E-04	2.10E-03	5.03E-05	—	—	—
TIN	X	NR	ND	—	5.80	0.03	NC	—	ND	—	ND	—	—	—	—
ARSENIC	X	NR	0.07	1.12E-03	4.42	0.02	NC	—	6.35	5.40E-06	3.55E-03	8.52E-05	—	—	—
MANGANESE	X	NR	NO BCF	—	42.44	0.24	NC	—	362.37	3.08E-03	0.18	4.29E-03	—	—	—
LEAD	X	NR	0.12	2.12E-03	1.11	0.01	NC	—	26.60	2.26E-04	3.32E-03	7.95E-05	—	—	—
ANTIMONY	X	NR	0.01	1.91E-04	ND	—	ND	—	20.23	1.72E-04	0.01	2.12E-04	—	—	—
NICKEL	X	NR	0.36	6.12E-03	18.03	0.10	NC	—	17.82	1.51E-04	2.78E-03	6.66E-05	—	—	—
ACROCLOR-1254	X	0.01	1.38E-04	ND	—	ND	—	0.18	1.55E-06	NR	—	—	—	—	—
BERYLLIUM	X	NR	ND	—	ND	—	NC	—	0.71	6.03E-06	ND	—	—	—	—
METHYLENE CHLORIDE	X	NR	0.02	2.64E-04	NR	—	NR	—	ND	—	ND	—	2.94E-03	7.04E-05	—
ACROCLOR-1260	X	0.00	6.60E-05	ND	—	ND	—	ND	—	ND	—	ND	—	—	—
CHROMIUM	X	NR	4.92E-03	8.42E-05	ND	—	NC	—	13.99	1.19E-04	1.63E-03	3.91E-05	—	—	—
ANTHRAZENE	X	NR	ND	—	NR	ND	—	ND	—	0.29	2.50E-06	ND	—	—	—
THALLIUM	X	NR	ND	—	ND	—	ND	—	0.98	8.32E-06	ND	—	—	—	—
PHENANTHRENE	X	NR	ND	—	NR	ND	—	ND	—	0.31	2.65E-06	ND	—	—	—
BENZO(k)FLUORANTHENE	X	NR	ND	—	NR	ND	—	ND	—	0.28	2.42E-06	ND	—	—	—
BENZO(a)PYRENE	X	NR	ND	—	NR	ND	—	ND	—	0.28	2.39E-06	ND	—	—	—
INDENO[1,2,3-cd]PYRENE	X	NR	ND	—	NR	ND	—	ND	—	0.29	2.46E-06	ND	—	—	—
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	ND	—	NR	ND	—	ND	—	1.24	1.06E-05	ND	—	—	—
FLUORANTHENE	X	NR	ND	—	NR	ND	—	ND	—	0.41	3.45E-06	ND	—	—	—
PYRENE	X	NR	ND	—	NR	ND	—	ND	—	0.34	2.91E-06	ND	—	—	—
BENZO(b)FLUORANTHENE	X	NR	ND	—	NR	ND	—	ND	—	0.27	2.28E-06	ND	—	—	—
BENZO(g,h,i)PERYLENE	X	NR	ND	—	NR	ND	—	ND	—	0.01	8.00E-08	NR	—	—	—
BENZO(a)ANTHRACENE	X	NR	ND	—	NR	ND	—	ND	—	0.29	2.46E-06	ND	—	—	—
CHRYSENE	X	NR	ND	—	NR	ND	—	ND	—	0.28	2.41E-06	ND	—	—	—
ALDRIN	X	NR	ND	—	NR	ND	—	ND	—	0.31	2.65E-06	ND	—	—	—
TOLUENE	X	NR	ND	—	NR	ND	—	ND	—	0.18	1.51E-06	ND	—	—	—
PHENOL	X	NR	ND	—	NR	ND	—	ND	—	0.30	2.56E-06	ND	—	—	—
BENZENE	X	NR	ND	—	NR	ND	—	NR	—	0.09	7.70E-07	ND	—	—	—
ACENAPHTHENE	X	NR	ND	—	NR	ND	—	ND	—	0.30	2.54E-06	ND	—	—	—

Summary of Ecotoxicological Risk to Mallards in the A-Ponds Source Area at RFETS

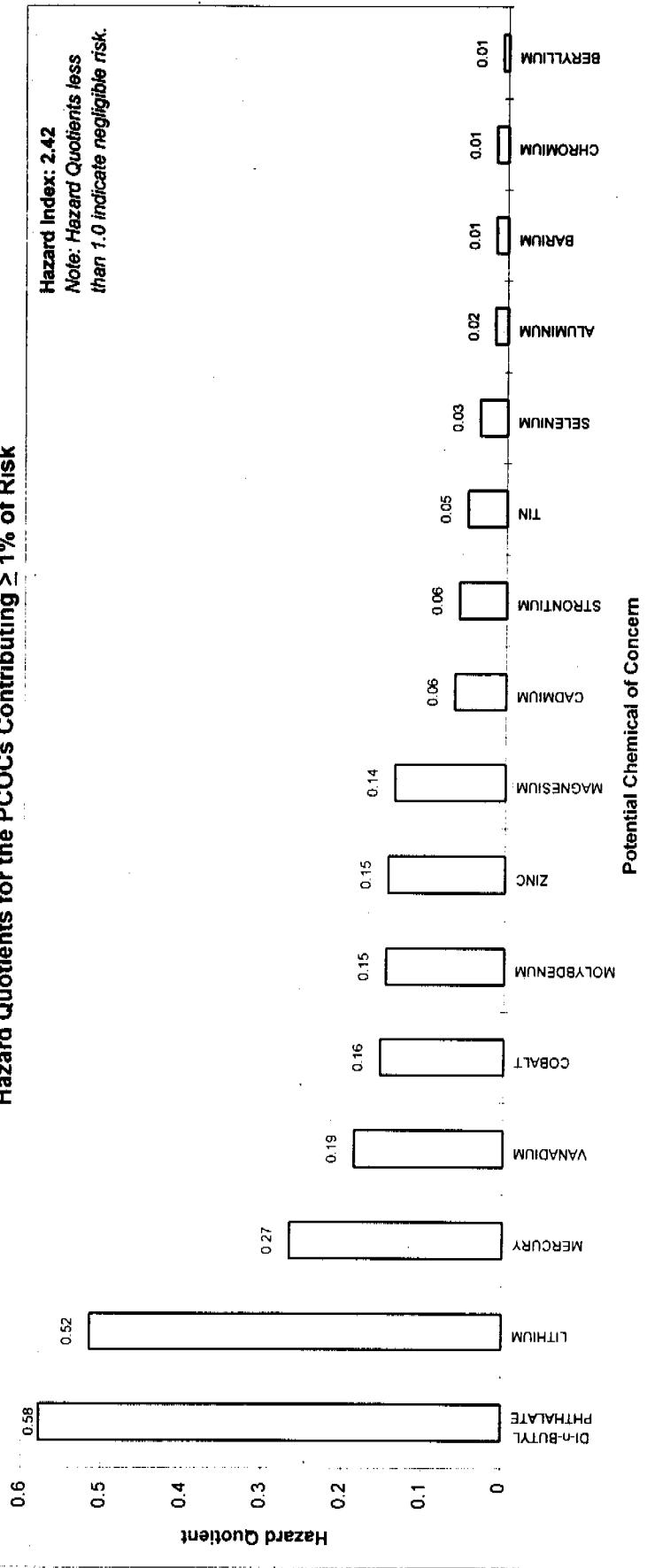
MALLARD A-PONDS	EXPOSURE POINT										
	Benthic Macroinvertebrates			Vegetation			Surficial Soil			Sediment	
	Estimated UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake	UCL ₉₅
Analyte	PCOC for OU6	IR = 0.04 SUF = 0.428		IR = 0.013 SUF = 0.428			IR = 0.00052 SUF = 0.017		IR = 0.0005 SUF = 0.017		IR = 0.056 SUF = 0.428
DI-n-OCTYL PHthalATE	X	NR	ND	—	NR	ND	—	ND	—	0.29	2.51E-06
SILVER	X	NR	ND	—	ND	—	ND	—	ND	—	—
ACETONE	X	NR	ND	—	NR	NR	—	NR	—	0.23	1.95E-06
										ND	—

Summary of Ecotoxicological Risk to Mallards in the A-Ponds Source Area at RFETS

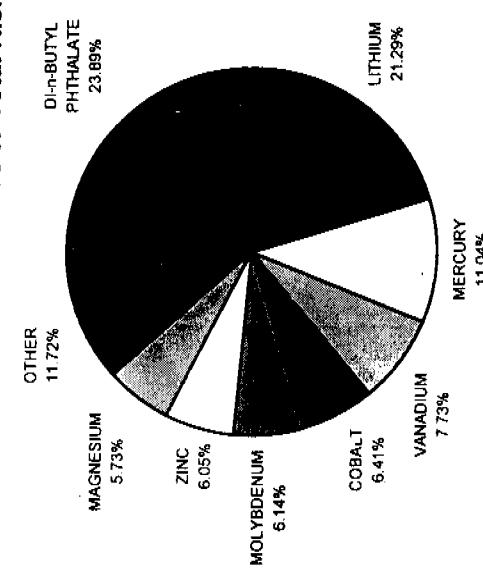
MALLARD A-PONDS		SUMMARY				
Analyte	PCOC for OU6	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
Di-n-OCTYL PHTHALATE	X	2.51E-06	46.32	<0.01	<0.01 %	
SILVER	X	4.47E-05	1078.77	<0.01	<0.01 %	
ACETONE	X	1.95E-06	85.61	<0.01	<0.01 %	
HAZARD INDEX		4.53				

Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

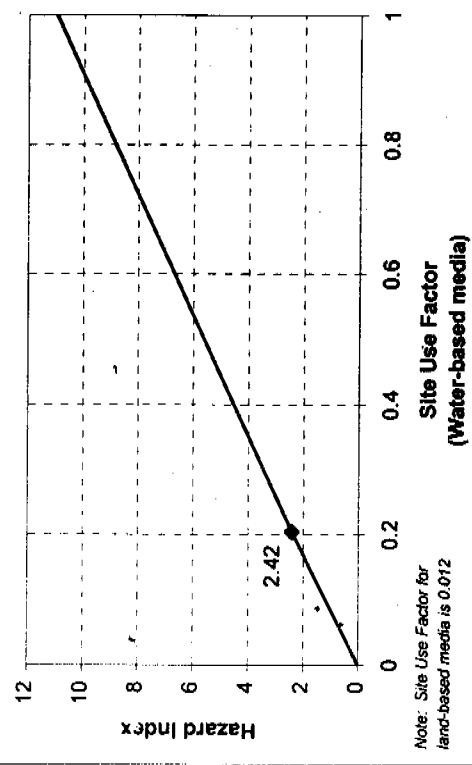
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



% Contributions of PCOCs to Total Risk

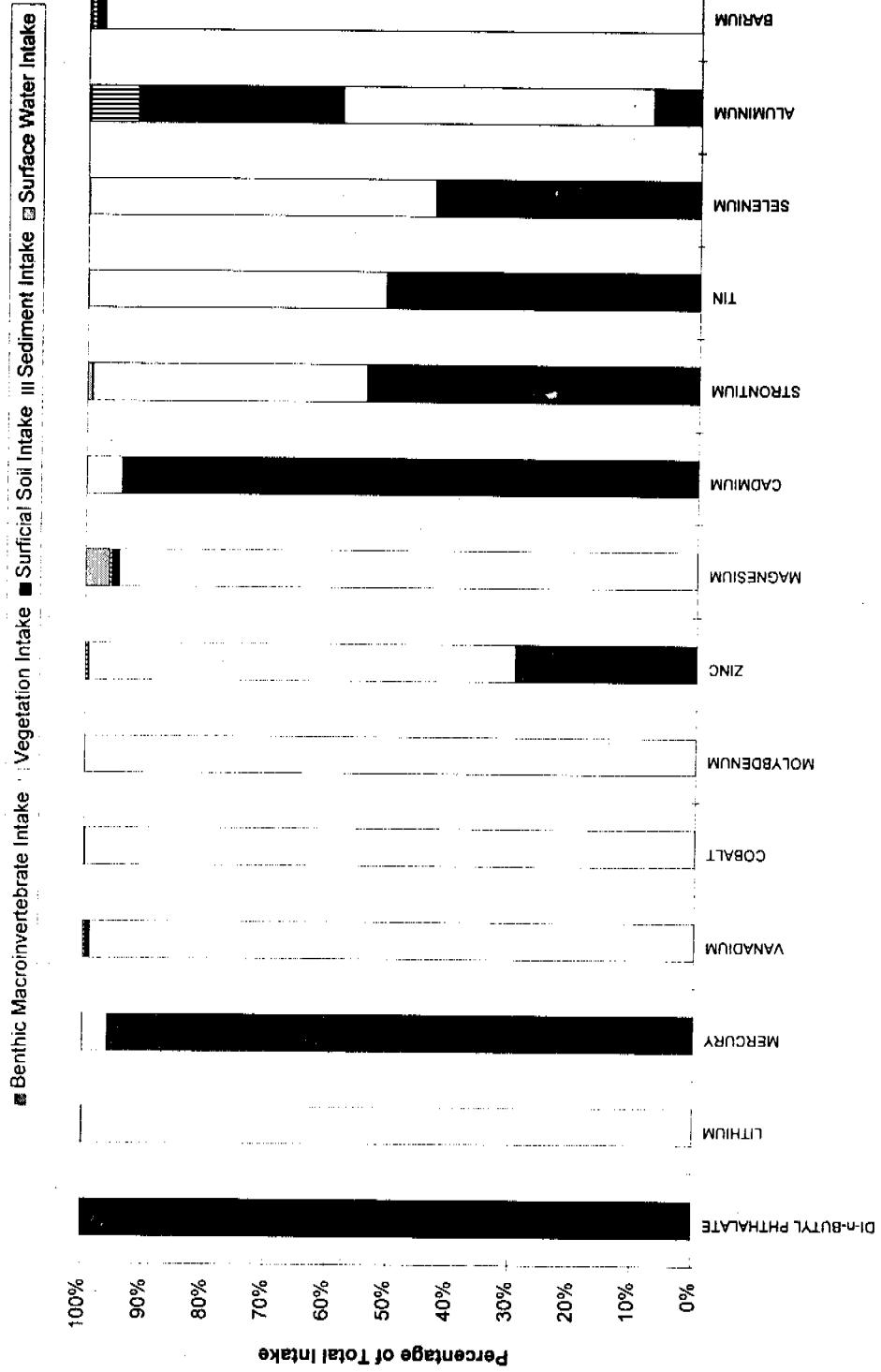


Hazard Index versus Site Use Factor



Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

MALLARD B-PONDS		EXPOSURE POINT													
		Benthic Macroinvertebrates				Vegetation				Sediment					
		Estimated Value	UCL ₉₅	Intake	UCL ₉₅ IR = 0.013 SUF = 0.204	Estimated Value	UCL ₉₅	Intake	UCL ₉₅ IR = 0.00052 SUF = 0.012	Estimated Intake	UCL ₉₅ IR = 0.0005 SUF = 0.012	Estimated Intake	UCL ₉₅ IR = 0.056 SUF = 0.204		
Analyte	PCOC for QU6	IR = 0.04 SUF = 0.204	NR	4.03	0.03	NR	ND	—	ND	—	ND	—	4.98E-03 5.69E-05		
Di-n-BUTYL PHthalATE	X	NR	NO BCF	—	45.27	0.12	NC	—	6.20	3.72E-05	0.02	1.98E-04			
LITHIUM	X	NR	NO BCF	0.01	0.10	2.57E-04	ND	—	0.34	2.04E-06	2.75E-04	3.14E-06			
MERCURY	X	NR	NO BCF	—	23.81	0.06	80.61	5.03E-04	32.78	1.97E-04	2.85E-03	3.26E-05			
VANADIUM	X	NR	NO BCF	—	25.51	0.07	13.25	8.27E-05	10.13	6.08E-05	1.58E-03	1.81E-05			
COBALT	X	NR	NO BCF	—	82.01	0.22	ND	—	ND	—	7.36E-03	8.40E-05			
MOLYBDENUM	X	NR	NO BCF	—	116.03	0.31	112.99	7.05E-04	279.26	1.68E-03	0.03	2.98E-04			
ZINC	X	NR	NO BCF	—	1669.75	4.43	8678.88	0.05	3643.55	0.02	15.50	0.18			
MAGNESIUM	X	NR	NO BCF	—	10.86	0.09	2.03	0.01	ND	—	2.89	1.73E-05	9.86E-04 1.13E-05		
CADMIUM	X	NR	NO BCF	—	26.30	0.21	66.45	0.18	NC	—	101.26	6.08E-04	0.26	2.92E-03	
STRONTIUM	X	NR	NO BCF	—	13.94	0.11	40.49	0.11	ND	—	21.23	1.27E-04	0.01	7.25E-05	
TIN	X	NR	NO BCF	—	0.70	0.01	2.82	0.01	ND	—	0.59	3.55E-06	2.02E-03	2.31E-05	
SELENIUM	X	NR	NO BCF	—	8.60	0.07	172.53	0.46	48139.56	0.30	11556.25	0.07	0.26	3.02E-03	
ALUMINUM	X	NR	NO BCF	—	53.77	0.14	337.48	2.11E-03	178.74	1.07E-03	0.05	5.88E-04			
BARIUM	X	NR	NO BCF	—	4.23E-05	5.29	0.01	48.86	3.05E-04	26.37	1.58E-04	2.21E-03	2.53E-05		
CHROMIUM	X	NR	NO BCF	—	3.55E-03	2.90E-05	ND	—	6.57	4.10E-05	2.93	1.76E-05	1.79E-04 2.04E-06		
BERYLLIUM	X	NR	NO BCF	—	ND	—	0.08	21.78	1.36E-04	42.04	ND	—			
COPPER	X	NR	NO BCF	—	0.83	0.01	NR	—	NR	—	ND	—	3.66E-03 4.18E-05		
TETRAChLORoETHENE	X	NR	NO BCF	—	53.95	0.14	509.65	3.18E-03	272.52	1.64E-03	0.10	1.12E-03			
MANGANESE	X	NR	NO BCF	—	1.27	3.38E-03	55.00	3.43E-04	54.43	3.27E-04	0.01	5.85E-05			
LEAD	X	NR	NO BCF	0.10	8.34E-04	ND	—	ND	—	25.42	1.53E-04	0.01	9.72E-05		
ANTIMONY	X	NR	NO BCF	0.01	8.38E-05	ND	—	0.01	8.55	5.34E-05	6.29	3.77E-05	2.25E-03 2.57E-05		
ARSENIC	X	NR	NO BCF	0.04	3.09E-04	4.44	0.01	2.71E-05	ND	—	1.54	9.26E-06	NR	—	
AROCLOR-1260	X	NR	NO BCF	0.03	2.78E-04	0.01	9.54E-04	NR	—	NR	—	ND	—	2.88E-03 3.29E-05	
TRICHLORoETHENE	X	NR	NO BCF	0.12	9.54E-04	0.01	13.89	0.04	18.05	1.13E-04	19.76	1.19E-04	3.56E-03 4.06E-05		
NICKEL	X	NR	NO BCF	0.64	0.01	5.19E-05	ND	—	ND	—	0.17	1.00E-06	NR	—	
THALLIUM	X	NR	NO BCF	0.01	NR	—	NR	—	3.05	1.90E-05	0.95	5.69E-06	ND	—	
BIS(2-ETHYLHEXYL)PHTHALATE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	12.83	7.70E-05	ND	—
PHENANTHRENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.74	4.47E-06	ND	—
BENZO(k)FLUORANTHENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.41	2.46E-06	ND	—
ANTHRACENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.33	1.96E-06	ND	—
BENZO(a)PYRENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.40	2.39E-06	ND	—
DIBENzo(a,h)ANTHRACENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.35	2.07E-06	ND	—
INDENO(1,2,3-cd)PYRENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.35	2.10E-06	ND	—
FLUORANTHENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	1.13	6.77E-06	ND	—
PYRENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.95	5.70E-06	ND	—
BENZO(b)FLUORANTHENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.85	5.12E-06	ND	—
SILVER	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	92.07	5.52E-04	ND	—
CHRYSENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.61	3.68E-06	ND	—
1,2-DICHLORoETHANE	X	NR	NO BCF	0.02	1.63E-04	NR	NR	—	NR	—	ND	—	2.54E-03	2.90E-05	
BENZO(a)ANTHRACENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.43	2.57E-06	ND	—
FLUORENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.35	2.11E-06	ND	—
BENZO(gh)PERYLENE	X	NR	NO BCF	—	NR	ND	—	NR	—	ND	—	0.35	2.07E-06	ND	—

Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

MALLARD B-PONDS		PCOC for OU6	SUMMARY			
			Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
Di-n-BUTYL PHTHALATE	X	0.03	0.06	0.58	23.89%	
LITHIUM		0.12	0.23	0.52	21.29%	
MERCURY	X	0.01	0.02	0.27	11.04%	
VANADIUM	X	0.06	0.34	0.19	7.73%	
COBALT	X	0.07	0.44	0.16	6.41%	
MOLYBDENUM	X	0.22	1.46	0.15	6.14%	
ZINC	X	0.44	3.02	0.15	6.05%	
MAGNESIUM	X	4.68	33.76	0.14	5.73%	
CADMUM		0.09	1.46	0.06	2.67%	
STRONTIUM	X	0.39	6.62	0.06	2.46%	
TIN		0.22	4.49	0.05	2.04%	
SELENIUM		0.01	0.38	0.03	1.43%	
ALUMINUM		0.90	57.42	0.02	0.65%	
BARIUM	X	0.15	9.90	0.01	0.61%	
CHROMIUM	X	0.01	1.03	0.01	0.58%	
BERYLLIUM		8.96E-05	0.01	0.01	0.28%	
COPPER	X	0.08	15.76	<0.01	0.21%	
TETRACHLOROETHENE	X	0.01	1.57	<0.01	0.18%	
MANGANESE	X	0.15	49.51	<0.01	0.12%	
LEAD	X	4.94E-03	1.80	<0.01	0.11%	
ANTIMONY	X	3.34E-04	0.13	<0.01	0.11%	
ARSENIC	X	0.01	5.13	<0.01	0.10%	
AROCLOR-1254	X	3.14E-04	0.17	<0.01	0.08%	
TRICHLOROETHENE	X	9.87E-04	1.24	<0.01	0.03%	
NICKEL	X	0.04	68.39,	<0.01	0.03%	
AROCLOR-1260	X	5.29E-05	0.17	<0.01	0.01%	
THALLIUM		2.47E-05	0.10	<0.01	0.01%	
BIS(2-ETHYLHEXYL)PHTHALATE	X	7.70E-05	0.57	<0.01	0.01%	
PHENANTHRENE	X	4.47E-06	0.04	<0.01	0.01%	
BENZO(k)FLUORANTHENE	X	2.46E-06	0.04	<0.01	<0.01%	
ANTHRACENE	X	1.96E-06	0.03	<0.01	<0.01%	
BENZO(a)PYRENE	X	2.39E-06	0.04	<0.01	<0.01%	
DIBENZO(a,h)ANTHRACENE	X	2.07E-06	0.04	<0.01	<0.01%	
INDENO(1,2,3- <i>cd</i>)PYRENE	X	2.10E-06	0.09	<0.01	<0.01%	
FLUORANTHENE	X	6.77E-06	0.36	<0.01	<0.01%	
PYRENE	X	5.70E-06	0.36	<0.01	<0.01%	
BENZO(b)FLUORANTHENE	X	5.12E-06	0.36	<0.01	<0.01%	
SILVER	X	0.01	1078.77	<0.01	<0.01%	
CHRYSENE	X	3.68E-06	0.36	<0.01	<0.01%	
1,2-DICHLOROETHANE	X	1.92E-04	19.17	<0.01	<0.01%	
BENZO(a)ANTHRACENE	X	2.57E-06	0.36	<0.01	<0.01%	
FLUORENE	X	2.11E-06	0.36	<0.01	<0.01%	
BENZO(g,h)PERYLENE	X	2.07E-06	0.36	<0.01	<0.01%	

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Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

MALLARD B-PONDS		EXPOSURE POINT									
		Benthic Macroinvertebrates			Vegetation			Surficial Soil			Sediment
Analyte	PCOC for OU6	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Estimated Value	Intake	UCL ₉₅	Intake	UCL ₉₅	Intake
		IR = 0.04	SUF = 0.204	IR = 0.013	SUF = 0.204	IR = 0.013	SUF = 0.204	IR = 0.0052	SUF = 0.012	IR = 0.0005	SUF = 0.012
ACETONE	X	NR	4.12E-03	3.36E-05	NR	NR	—	NR	—	0.19	1.14E-06
HEPTACHLOR	X	NR	—	NR	ND	—	ND	—	—	0.01	4.00E-08
TOLUENE	X	NR	ND	—	NR	—	NR	—	—	0.28	1.67E-06
PHENOL	X	NR	ND	—	NR	ND	—	ND	—	0.34	2.04E-06
METHYLENE CHLORIDE	X	NR	ND	—	NR	NR	—	NR	—	0.01	6.00E-08
2-METHYLNAPHTHALENE	X	NR	ND	—	NR	ND	—	ND	—	0.34	2.04E-06
ACENAPHTHENE	X	NR	ND	—	NR	ND	—	ND	—	0.34	2.05E-06
NAPHTHALENE	X	NR	ND	—	NR	ND	—	ND	—	0.35	2.11E-06
Di-n-OCTYL PHthalate	X	NR	ND	—	NR	ND	—	ND	—	0.33	2.00E-06
BUTYL BENZYL PHthalate	X	NR	ND	—	NR	ND	—	ND	—	0.34	2.05E-06
gamma-BHC (LINDANE)	X	NR	NR	—	NR	ND	—	ND	—	0.01	3.00E-08

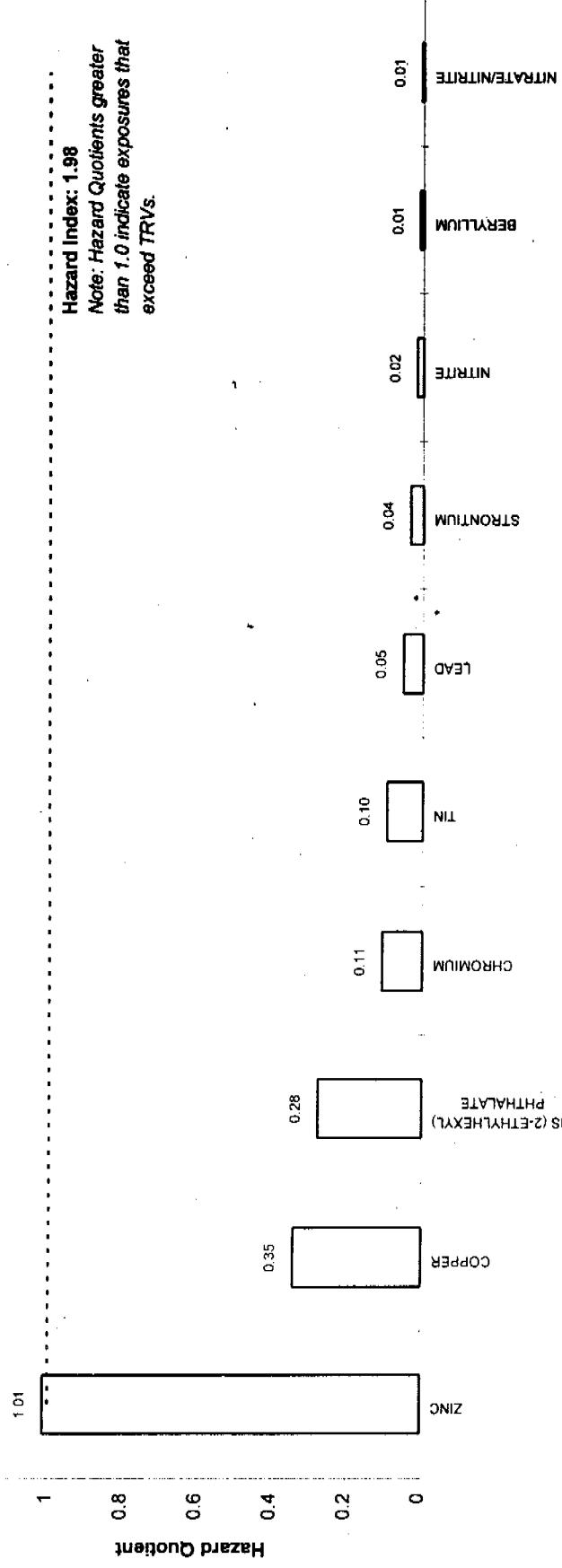
Summary of Ecotoxicological Risk to Mallards in the B-Ponds Source Area at RFETS

MALLARD B-PONDS		SUMMARY			
Analyte	PCOC for OU6	Total Intake	Toxicity Reference Value	Hazard Quotient	Percent of Total Risk
ACETONE	X	1.56E-04	85.61	<0.01	<0.01%
HEPTACHLOR	X	4.00E-08	0.03	<0.01	<0.01%
TOLUENE	X	1.67E-06	4.35	<0.01	<0.01%
PHENOL	X	2.04E-06	19.41	<0.01	<0.01%
METHYLENE CHLORIDE	X	6.00E-08	0.80	<0.01	<0.01%
2-METHYLNAPHTHALENE	X	2.04E-06	36.33	<0.01	<0.01%
ACENAPHTHENE	X	2.05E-06	36.33	<0.01	<0.01%
NAPHTHALENE	X	2.11E-06	36.33	<0.01	<0.01%
DI-n-OCTYL PHTHALATE	X	2.00E-06	46.32	<0.01	<0.01%
BUTYL BENZYL PHTHALATE	X	2.05E-06	106.03	<0.01	<0.01%
gamma-BHC (JINDANE)	X	3.00E-08	2.00	<0.01	<0.01%

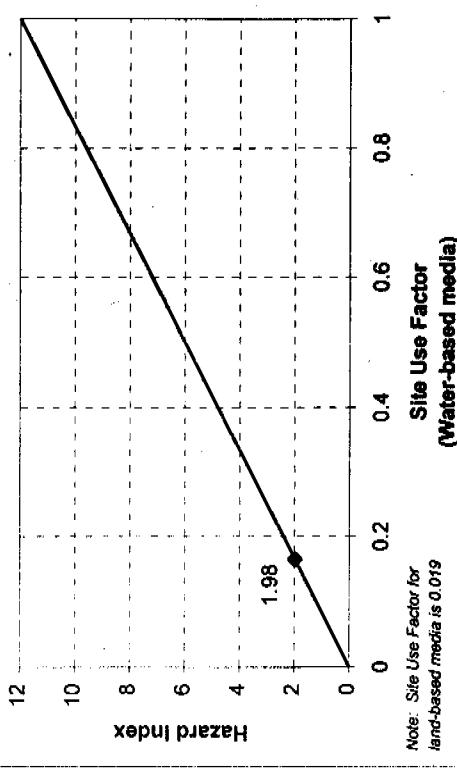
HAZARD INDEX 2.42

Summary of Ecotoxicological Risk to Mallards in the C-Ponds Source Area at RFETS

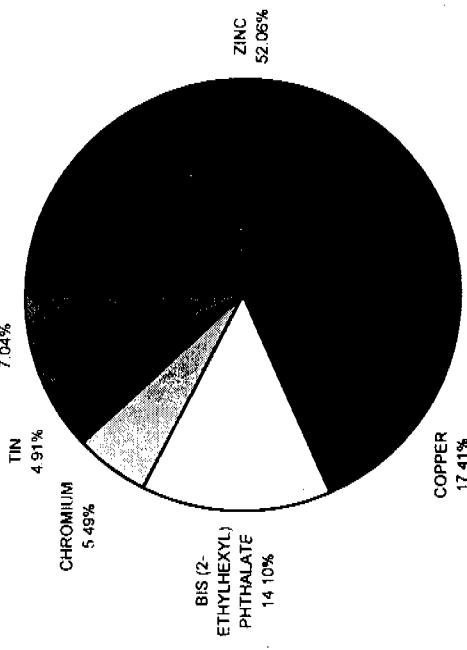
Hazard Quotients for the PCOCs Contributing $\geq 1\%$ of Risk



Hazard Index versus Site Use Factor

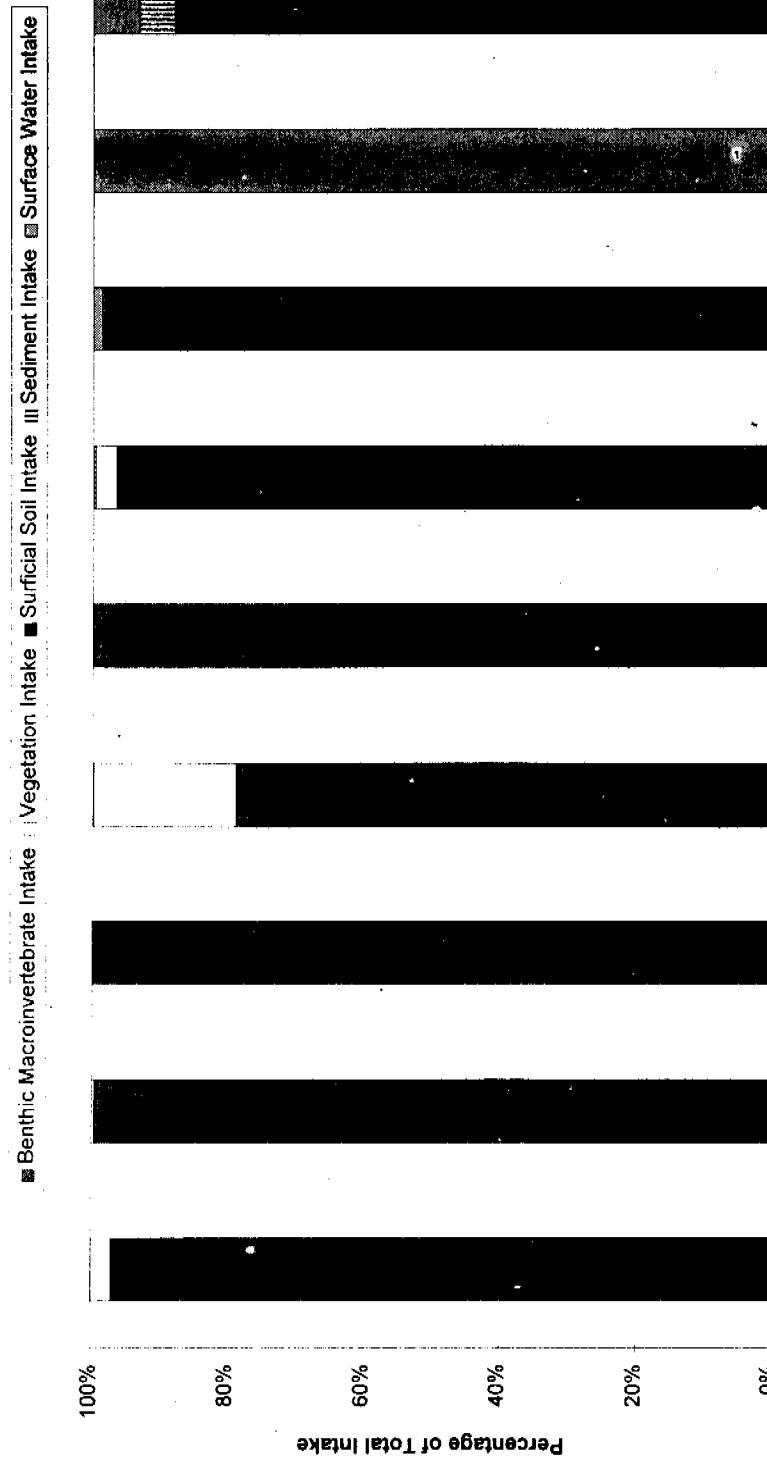


% Contributions of PCOCs to Total Risk



Summary of Ecotoxicological Risk to Mallards in the C-Ponds Source Area at RFETS

Contribution of Exposure Points to Total Intake



Potential Chemical of Concern

Summary of Ecotoxicological Risk to Mallards in the C-Ponds Source Area at RFETS

Analyte	MALLARD C-PONDS		EXPOSURE POINT													
			Benthic Macroinvertebrates				Vegetation				Surficial Soil				Sediment	
	UCL ₉₅	Estimated Value	Intake	IR = 0.013 FI = 0.165	UCL ₉₅	Estimated Value	Intake	IR = 0.00052 FI = 0.019	UCL ₉₅	Estimated Value	Intake	IR = 0.00055 FI = 0.019	UCL ₉₅	Intake	IR = 0.00056 FI = 0.165	
ZINC	X	449.45	2.97	41.40	0.09	NC	—	94.33	8.96E-04	0.05	4.48E-04	—	—	—	—	
COPPER	X	822.03	5.43	8.93	0.02	NC	—	23.08	2.19E-04	0.01	7.37E-05	—	—	—	—	
BIS (2-ETHYLHEXYL) PHTHALATE	X	NR	24.26	0.16	NR	ND	—	0.64	6.08E-06	0.01	4.98E-05	—	—	—	—	
CHROMIUM	X	13.45	0.09	10.96	0.02	NC	—	14.04	1.33E-04	4.76E-03	4.40E-05	—	—	—	—	
TIN	NR	66.24	0.44	NR	—	NC	—	12.06	1.15E-04	0.02	1.98E-04	—	—	—	—	
LEAD	X	14.05	0.09	1.36	2.91E-03	NC	—	32.42	3.08E-04	0.01	5.83E-05	—	—	—	—	
STRONTIUM	X	NR	34.88	0.23	NR	—	NC	—	62.80	5.97E-04	0.34	3.11E-03	—	—	—	—
NITRITE	NR	—	—	NR	—	NR	—	ND	—	—	0.02	1.74E-04	—	—	—	—
BERYLLIUM	NR	0.02	1.22E-04	NR	—	ND	—	0.77	7.29E-06	9.99E-04	9.23E-06	—	—	—	—	
NITRATE/NITRITE	NR	NO BCF	—	NR	—	NR	—	3.57	3.39E-05	0.54	5.00E-03	—	—	—	—	
ALUMINUM	NR	12.74	0.08	NR	—	NC	—	13018.07	0.12	2.43	0.02	—	—	—	—	
MAGNESIUM	NR	NO BCF	—	NR	—	NC	—	3157.85	0.03	10.77	0.10	—	—	—	—	
CADMIUM	ND	—	2.48	0.01	ND	—	0.90	8.53E-06	2.59E-03	2.39E-05	—	—	—	—	—	
ANTIMONY	X	NR	0.02	1.32E-04	NR	—	ND	—	ND	—	0.02	1.42E-04	—	—	—	—
VANADIUM	NR	NO BCF	—	NR	—	NC	—	33.89	3.22E-04	0.01	1.07E-04	—	—	—	—	
LITHIUM	X	NR	NO BCF	—	NR	—	NC	—	10.54	1.00E-04	0.02	1.91E-04	—	—	—	—
COBALT	X	NR	NO BCF	—	NR	—	NC	—	9.58	9.10E-05	0.01	7.34E-05	—	—	—	—
THALLIUM	NR	ND	—	NR	—	ND	—	0.83	7.92E-06	2.34E-03	2.16E-05	—	—	—	—	
TOLUENE	X	NR	0.18	1.16E-03	NR	NR	—	NR	—	0.15	1.39E-06	2.52E-03	2.33E-05	—	—	—
BARIUM	X	NR	NO BCF	—	NR	—	NC	—	177.77	1.69E-03	0.11	1.01E-03	—	—	—	—
MERCURY	X	ND	—	ND	—	ND	—	0.39	3.73E-06	1.41E-04	1.30E-06	—	—	—	—	
METHYLENE CHLORIDE	X	NR	0.02	1.27E-04	NR	NR	—	NR	—	0.02	1.90E-07	3.67E-03	3.39E-05	—	—	—
MOLYBDENUM	NR	NO BCF	—	NR	—	ND	—	4.83	4.59E-05	0.02	2.17E-04	—	—	—	—	
MANGANESE	NR	NO BCF	—	NR	—	NC	—	521.40	4.95E-03	0.12	1.11E-03	—	—	—	—	
DI-n-BUTYL PHthalate	X	NR	ND	—	NR	ND	—	0.55	5.18E-06	ND	—	—	—	—	—	—
NICKEL	NR	0.89	0.01	NR	—	NC	—	15.65	1.49E-04	0.01	8.02E-05	—	—	—	—	
SELENIUM	ND	—	—	ND	—	NC	—	1.35	1.29E-05	1.85E-03	1.71E-05	—	—	—	—	
ARSENIC	NR	0.04	2.33E-04	NR	—	NC	—	4.89	4.65E-05	2.23E-03	2.06E-05	—	—	—	—	
FLUORANTHENE	X	NR	ND	—	NR	NC	—	0.54	5.09E-06	ND	—	—	—	—	—	—
ACETONE	NR	0.01	3.73E-05	NR	—	NR	—	0.12	1.18E-06	0.01	1.34E-04	—	—	—	—	
delta-BHC	NR	ND	—	NR	—	ND	—	0.02	2.10E-07	ND	—	—	—	—	—	—
PHENOL	X	NR	ND	—	NR	ND	—	0.54	5.09E-06	ND	—	—	—	—	—	—
1,1,1-TRICHLOROETHANE	NR	ND	—	NR	—	NR	—	0.01	6.00E-08	ND	—	—	—	—	—	—
BUTYL BENZYL PHthalate	X	NR	ND	—	NR	ND	—	0.55	5.26E-06	ND	—	—	—	—	—	—
SILVER	X	ND	—	ND	—	ND	—	2.33	2.22E-05	3.60E-03	3.33E-05	—	—	—	—	—

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Summary of Ecotoxicological Risk to Mallards in the C-Ponds Source Area at RFETS

MALLARD C-PONDS		PCOC for OU5	SUMMARY			
Analyte	Total Intake		Toxicity Reference Value	Hazard Quotient	Percent of Total Risk	
ZINC	X	3.06	3.02	1.01	51.06%	
COPPER	X	5.44	15.76	0.35	17.41%	
BIS (2-ETHYLHEXYL) PHthalat	X	0.16	0.57	0.28	14.10%	
CHROMIUM		0.11	1.03	0.11	5.49%	
TIN	0.44	4.49	0.10	4.91%		
LEAD	X	0.10	1.80	0.05	2.68%	
STRONTIUM	X	0.23	6.62	0.04	1.78%	
NITRITE		1.74E-04	0.01	0.02	0.85%	
BERYLLIUM		1.38E-04	0.01	0.01	0.52%	
NITRATE/NITRITE		0.01	0.94	0.01	0.27%	
ALUMINUM		0.23	57.42	<0.01	0.20%	
MAGNESIUM		0.13	33.76	<0.01	0.19%	
CADMIUM		0.01	1.46	<0.01	0.19%	
ANTIMONY	X	2.74E-04	0.13	<0.01	0.11%	
VANADIUM		4.29E-04	0.34	<0.01	0.06%	
LITHIUM	X	2.91E-04	0.23	<0.01	0.06%	
COBALT	X	1.64E-04	0.44	<0.01	0.02%	
THALLIUM		2.95E-05	0.10	<0.01	0.01%	
TOLUENE	X	1.19E-03	4.35	<0.01	0.01%	
BARIUM	X	2.70E-03	9.90	<0.01	0.01%	
MERCURY	X	5.03E-06	0.02	<0.01	0.01%	
METHYLENE CHLORIDE	X	1.61E-04	0.80	<0.01	0.01%	
MOLYBDENUM		2.63E-04	1.46	<0.01	0.01%	
MANGANESE		0.01	49.51	<0.01	0.01%	
DI-n-BUTYL PHthalate	X	5.18E-06	0.06	<0.01	<0.01%	
NICKEL		0.01	68.39	<0.01	<0.01%	
SELENIUM		3.00E-05	0.38	<0.01	<0.01%	
ARSENIC		3.00E-04	5.13	<0.01	<0.01%	
FLUORANTHENE	X	5.09E-06	0.36	<0.01	<0.01%	
ACETONE		1.72E-04	85.61	<0.01	<0.01%	
delta-BHC		2.10E-07	0.29	<0.01	<0.01%	
PHENOL	X	5.09E-06	19.41	<0.01	<0.01%	
1,1,1-TRICHLOROETHANE		6.00E-08	1.26	<0.01	<0.01%	
BUTYL BENZYL PHthalate	X	5.26E-06	106.03	<0.01	<0.01%	
SILVER	X	5.54E-05	1078.77	<0.01	<0.01%	
		HAZARD INDEX				1.98

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SUMMARY OF ECOLOGICAL RISK TO AQUATIC LIFE FROM SURFACE WATER

Areas evaluated: A-Ponds, B-Ponds, C-Ponds, North Walnut Creek,
South Walnut Creek, Woman Creek

Highest risk source area: Pond A-2

PCOCs with HQ > 1.0: barium, carbon disulfide, manganese, lead, strontium,
(un-ionized ammonia)

Key uncertainties in exposure and risk estimate:

- Barium TRV is based on EPA secondary chronic value. The value is very low.
- Calculation of TRVs for PAHs based on state water quality standards intended for protection of human health

Suggested further action:

ECOCs: barium, carbon disulfide, manganese, lead, strontium, (un-ionized ammonia)

1. Evaluate benthic community data to assess effects in each stream segment and pond
2. Characterize risk of individual ponds and stream segments
3. Evaluate potential effects of physical manipulation of flows and levels in ponds
4. Evaluate available toxicity test data to assess predicted versus actual toxicity of surface water
5. Evaluate potential for contaminant fluxes due to storms or other event-related surface water flows

Summary of Surface Water PCOCs Exceeding Water Quality Standards

OU5 Ash Pits

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	64.56	147.00	30/39	38.68	16.99
LEAD	1.50	UG/L	2.99	8.00	9/39	5.33	1.99
CARBON DISULFIDE	2.00	UG/L	2.73	6.00	1/40	3.00	1.37
MANGANESE	50.00	UG/L	44.09	198.00	29/39	3.96	0.88
ZINC	45.00	UG/L	12.89	71.30	18/41	1.58	0.29

HAZARD INDEX **52.56** **21.52**

OU5 Old Landfill

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	142.23	178.00	27/32	46.84	37.43
LEAD	1.50	UG/L	3.49	6.50	8/32	4.33	2.33
MANGANESE	50.00	UG/L	19.43	71.90	24/31	1.44	0.39
ZINC	45.00	UG/L	14.93	68.50	17/31	1.52	0.33

HAZARD INDEX **54.14** **40.48**

OU1 881 Hillside

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	99.77	164.00	141/187	43.16	26.25
STRONTIUM	620.00	UG/L	1006.62	42800.00	149/184	69.03	1.62
LEAD	1.50	UG/L	2.24	7.80	58/181	5.20	1.49
CARBON DISULFIDE	2.00	UG/L	2.57	8.00	2/184	4.00	1.29
ZINC	45.00	UG/L	15.52	109.00	105/183	2.42	0.34
MANGANESE	50.00	UG/L	19.03	102.00	147/184	2.04	0.38

HAZARD INDEX **82.69** **5.13**

OU5 C-Ponds

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	92.98	153.00	48/60	40.26	24.47
MANGANESE	50.00	UG/L	58.78	441.00	53/60	8.82	1.18
LEAD	1.50	UG/L	2.10	4.40	17/59	2.93	1.40
ZINC	45.00	UG/L	12.18	47.60	31/60	1.06	0.27

HAZARD INDEX **53.07** **27.31**

Summary of Surface Water PCOCs Exceeding Water Quality Standards

OU6 A-Ponds

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	56.53	92.40	25/25	24.32	14.88
MANGANESE	50.00	UG/L	67.81	262.00	25/25	5.24	1.36
LEAD	1.50	UG/L	2.76	6.50	11/24	4.33	1.84

HAZARD INDEX **33.89** **18.07**

OU6 B-Ponds

Chemical	Water Quality Standards	Units	One-Tailed UCL ₉₅	Maximum Detection	Frequency of Hits	Hazard Quotient Based on Maximum Detection	Hazard Quotient Based on UCL ₉₅
BARIUM	3.80	UG/L	48.66	125.00	26/26	32.89	12.80
MANGANESE	50.00	UG/L	76.74	214.00	26/26	4.28	1.53
LEAD	1.50	UG/L	2.27	4.60	10/26	3.07	1.51

HAZARD INDEX **40.24** **15.85**

SUMMARY OF ECOLOGICAL RISK TO AQUATIC LIFE FROM SEDIMENTS

Areas evaluated: A-Ponds, B-Ponds, C-Ponds, North Walnut Creek, South Walnut Creek, Woman Creek

Highest risk source area: Pond A-2

PCOCs with HQ > 10: Aldrin, Aroclor-1254, Aroclor-1260, benzoic acid, heptachlor, methylene chloride, PAHs, silver

Key uncertainties in exposure and risk estimate:

- Chemical factors affecting of PCOCs in sediments (e.g., equilibrium concentrations in water)
- Physical factors affecting of PCOCs in sediments (e.g., spatial distribution and depth of samples)
- Calculation of TRVs for PAHs based on state water quality standards intended for protection of human health

Suggested further action:

ECOCs: Aldrin, Aroclor-1254, Aroclor-1260, benzoic acid, heptachlor, methylene chloride, PAHs, silver

1. Evaluate benthic community data to assess effects in each stream segment and pond
2. Characterize risk of individual ponds and stream segments
3. Evaluate potential effects of physical manipulation of flows and levels in ponds
4. Evaluate available toxicity test data to assess predicted versus actual toxicity of sediments

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Comparison of Preliminary Sediment Risk Calculations with Toxicity Testing and Benthic Community Analysis Results for RFETS Surface Impoundments

Pond	Hazard Index (HI)		Species Similarity to Pond D-2					Toxicity Test Results	
	HI _{max}	HI _{CL95}	Species Richness	Jaccard Coefficient	Fathead Minnows Present?	Bass Present?	Percent Surviving	<i>Hyalella azteca</i>	<i>Chironomus tentans</i>
Pond A-1 ¹	160	396	48	0.354	N	N	95	No	*
Pond A-2 ¹	39433	25820	24	0.196	N	Y	89	No	*
Pond A-3 ¹	65	59.1	17	0.120	N	N	76	No	103
Pond A-4 ¹	14.1	13.1	7	0.069	Y	N	99	No	No
Pond A-5 ²	16.8	22.6	19	0.094	Y	N	89	No	*
Pond B-1 ¹	6058	6340	36	0.298	N	N	91	No	*
Pond B-2 ¹	78.4	96	35	0.287	N	N	64	Yes	*
Pond B-3 ¹	287	184	12	0.077	N	N	84	No	88
Pond B-4 ¹	334	404	20	0.152	Y	N	91	No	62
Pond B-5 ¹	9	8.1	17	0.157	Y	N	60	No	72
Pond C-1 ³	2.55	3.26	5	0.046	Y	Y	80	No	*
Pond C-2 ³	3.01	124	16	0.097	Y	N	96	No	*
Pond D-1 ¹			73	0.325					
Pond D-2 ¹		86		N/A					

¹ Benthos data collected May-June, 1994. Taxonomic identification and enumeration performed by Ecosystem Testing Designs Inc., Lawrence, KS.

² Benthos data collected May, 1993. Taxonomic identification and enumeration performed by Versar Laboratories, Columbia, MD.

³ Benthos data collected May, 1991. Taxonomic identification and enumeration performed by Chadwick & Associates, Littleton, CO.

*Availability of Chironomids and sample holding time limits resulted in inability to perform toxicity tests on this organism for the listed samples.

Note: Species richness and HI_{CL95} are significantly correlated (Spearman rank correlation coefficient = 0.67, p = 0.0.017)

Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond A-1

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ANTHRAZENE	0.99	UG/KG	2/5	88.00	88.53
CHRYSENE	9.28	UG/KG	5/5	350.00	37.72
BENZO(b)FLUORANTHENE	20.80	UG/KG	3/5	420.00	20.19
ANTIMONY	7.67	MG/KG	2/5	30.40	3.96
MAGNESIUM	1,800.00	MG/KG	5/5	4,270.00	2.37
AROCLOR-1254	270.00	UG/KG	10/10	590.00	2.19
COBALT	6.86	MG/KG	5/5	13.00	1.90
VANADIUM	21.60	MG/KG	5/5	36.80	1.70
BENZO(k)FLUORANTHENE	165.00	UG/KG	4/5	200.00	1.21

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**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond A-2 .**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ALDRIN	1.37E-03	UG/KG	1/5	54.00	39,416.06
CHRYSENE	17.80	UG/KG	1/5	71.00	3.99
ZINC	150.00	MG/KG	5/5	409.00	2.73
MAGNESIUM	1,800.00	MG/KG	5/5	4,440.00	2.47
BENZOIC ACID	196.00	UG/KG	4/5	330.00	1.68
ACETONE	167.00	UG/KG	2/5	260.00	1.56
COBALT	6.86	MG/KG	5/5	10.60	1.55
VANADIUM	21.60	MG/KG	5/5	32.00	1.48
AROCLOR-1254	518.00	UG/KG	4/9	590.00	1.14

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39,432.65

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Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond A-3

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ANTIMONY	7.67	MG/KG	1/4	26.00	3.39
MAGNESIUM	1,800.00	MG/KG	5/5	5,340.00	2.97
BENZO(b)FLUORANTHENE	17.70	UG/KG	4/5	370.00	20.90
CHRYSENE	7.92	UG/KG	5/5	250.00	31.57
ZINC	150.00	MG/KG	5/5	155.00	1.03
VANADIUM	21.60	MG/KG	5/5	62.70	2.90
COBALT	6.86	MG/KG	5/5	15.50	2.26

HAZARD INDEX

65.02

**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond A-4**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ANTIMONY	7.67	MG/KG	3/4	41.40	5.40
MAGNESIUM	1,800.00	MG/KG	5/5	5,220.00	2.90
VANADIUM	21.60	MG/KG	5/5	57.70	2.67
COBALT	6.86	MG/KG	5/5	13.90	2.03
ZINC	150.00	MG/KG	5/5	169.00	1.13

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14.12

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**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek—Pond A-5**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
BENZOIC ACID	65.30	UG/KG	4/5	500.00	7.66
ACETONE	55.60	UG/KG	1/5	210.00	3.78
COBALT	6.86	MG/KG	5/5	13.30	1.94
MAGNESIUM	1,800.00	MG/KG	5/5	3,050.00	1.69
VANADIUM	21.60	MG/KG	5/5	36.40	1.69

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16.75

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Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond B-1

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
NAPHTHALENE	0.11	UG/KG	1/7	390.00	3,482.14
FLUORENE	0.32	UG/KG	2/7	460.00	1,424.15
HEPTACHLOR	0.08	UG/KG	1/7	39.00	475.61
ANTHRACENE	1.69	UG/KG	3/7	490.00	289.94
SILVER	2.74	MG/KG	7/7	345.00	125.91
CHRYSENE	15.80	UG/KG	6/7	1,900.00	120.25
BENZO(b)FLUORANTHENE	35.40	UG/KG	5/7	3,100.00	87.57
AROCLOR-1254	460.00	UG/KG	10/12	10,000.00	21.74
ZINC	150.00	MG/KG	7/7	1,270.00	8.47
METHYLENE CHLORIDE	2.06	UG/KG	1/5	9.00	4.37
COPPER	34.00	MG/KG	7/7	125.00	3.68
BENZO(k)FLUORANTHENE	281.00	UG/KG	5/7	1,000.00	3.56
ACETONE	148.00	UG/KG	4/5	390.00	2.64
MAGNESIUM	1,800.00	MG/KG	7/7	3,900.00	2.17
COBALT	6.86	MG/KG	7/7	11.50	1.68
VANADIUM	21.60	MG/KG	7/7	33.10	1.53
DIBENZO(a,h)ANTHRACENE	107.00	UG/KG	1/7	150.00	1.40
CHROMIUM	81.00	MG/KG	7/7	96.10	1.19

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6,057.99

Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond B-2

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
SILVER	2.74	MG/KG	3/3	141.00	51.46
AROC-OR-1254	757.00	UG/KG	9/10	6,600.00	8.72
CHRYSENE	26.00	UG/KG	2/4	200.00	7.69
ACETONE	244.00	UG/KG	3/4	810.00	3.32
MAGNESIUM	1,800.00	MG/KG	4/4	5,650.00	3.14
COBALT	6.86	MG/KG	4/4	12.20	1.78
MANGANESE	460.00	MG/KG	4/4	558.00	1.21
VANADIUM	21.60	MG/KG	3/3	24.20	1.12

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Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond B-3

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
AROCLOR-1260	8.32	UG/KG	3/10	860.00	103.37
SILVER	2.74	MG/KG	7/7	240.00	87.59
CHRYSENE	12.40	UG/KG	2/7	510.00	41.13
BENZO(b)FLUORANTHENE	27.80	UG/KG	5/7	770.00	27.70
ANTIMONY	7.67	MG/KG	2/3	68.50	8.93
AROCLOR-1254	361.00	UG/KG	10/12	2,900.00	8.03
COPPER	34.00	MG/KG	7/7	97.00	2.85
ZINC	150.00	MG/KG	7/7	346.00	2.31
MAGNESIUM	1,800.00	MG/KG	7/7	3,560.00	1.98
COBALT	6.86	MG/KG	7/7	12.40	1.81
VANADIUM	21.60	MG/KG	7/7	32.70	1.51

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ZY
**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
 Walnut Creek — Pond B-4**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ANTHRACENE	0.95	UG/KG	5/8	100.00	105.37
BENZO(b)FLUORANTHENE	19.80	UG/KG	8/8	1,500.00	75.76
CHRYSENE	8.86	UG/KG	8/8	650.00	73.36
SILVER	2.74	MG/KG	3/8	102.00	37.23
gamma-BHC (LINDANE)	1.12	UG/KG	1/7	25.00	22.32
AROCLOR-1254	258.00	UG/KG	10/13	1,100.00	4.26
ANTIMONY	7.67	MG/KG	2/4	25.60	3.34
MAGNESIUM	1,800.00	MG/KG	8/8	4,780.00	2.66
BENZO(k)FLUORANTHENE	158.00	UG/KG	8/8	360.00	2.28
VANADIUM	21.60	MG/KG	8/8	46.20	2.14
ZINC	150.00	MG/KG	8/8	319.00	2.13
COBALT	6.86	MG/KG	8/8	11.10	1.62
COPPER	34.00	MG/KG	8/8	38.40	1.13

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333.59

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**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Pond B-5**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
MAGNESIUM	1,800.00	MG/KG	5/5	4,840.00	2.69
VANADIUM	21.60	MG/KG	5/5	47.80	2.21
COBALT	6.86	MG/KG	5/5	11.00	1.60
ACETONE	65.00	UG/KG	1/5	87.00	1.34
ZINC	150.00	MG/KG	5/5	174.00	1.16

HAZARD INDEX

9.00

Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Ponds C-1 & C-2

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
BENZOIC ACID	192.00	UG/KG	3/3	490.00	2.55

HAZARD INDEX **2.55**

Pond C-2					
BENZOIC ACID	144.00	UG/KG	1/2	240.00	1.67
ZINC	150.00	MG/KG	3/3	201.00	1.34

HAZARD INDEX **3.01**

Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Landfill Pond

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
FLUORENE	0.12	UG/KG	1/3	92.00	786.32
ANTHRACENE	0.62	UG/KG	1/3	160.00	259.74
CHRYSENE	5.75	UG/KG	1/3	310.00	53.91
BENZO(b)FLUORANTHENE	12.90	UG/KG	1/3	470.00	36.43
BENZOIC ACID	63.30	UG/KG	3/3	870.00	13.74
BARIUM	90.40	MG/KG	4/4	215.00	2.38
VANADIUM	21.60	MG/KG	4/4	41.00	1.90
MAGNESIUM	1,800.00	MG/KG	2/2	3,250.00	1.81
BENZO(k)FLUORANTHENE	102.00	UG/KG	1/3	130.00	1.27
ZINC	150.00	MG/KG	4/4	187.00	1.25
STRONTIUM	49.90	MG/KG	2/2	61.50	1.23
BENZO(ghi)PERYLENE	182.00	UG/KG	1/3	200.00	1.10

HAZARD INDEX **1,161.09**

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**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — North Walnut Creek**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ANTHRACENE	0.61	UG/KG	1/11	65.00	107.44
CHRYSENE	5.65	UG/KG	3/11	180.00	31.86
BENZO(b)FLUORANTHENE	12.60	UG/KG	2/11	200.00	15.87
METHYLENE CHLORIDE	0.74	UG/KG	1/10	7.00	9.51
BENZOIC ACID	62.20	UG/KG	4/11	510.00	8.20
MANGANESE	460.00	MG/KG	11/11	1,000.00	2.17
MAGNESIUM	1,800.00	MG/KG	11/11	3,580.00	1.99
BARIUM	90.40	MG/KG	11/11	177.00	1.96
STRONTIUM	49.90	MG/KG	11/11	95.40	1.91
COBALT	6.86	MG/KG	11/11	12.40	1.81
VANADIUM	21.60	MG/KG	11/11	33.90	1.57
ACETONE	53.00	UG/KG	1/10	63.00	1.19
ZINC	150.00	MG/KG	11/11	178.00	1.19

HAZARD INDEX

186.66

**Summary of Sediment PCOCs Exceeding Toxicity Reference Values at Rocky Flats Environmental Technology Site
Walnut Creek — Woman Creek**

Chemical	Toxicity Reference Value	Units	Frequency of Hits	Maximum Detection	Hazard Quotient Based on Maximum Detection
ZINC	150.00	MG/KG	45/45	1,050.00	7.00
COPPER	34.00	MG/KG	39/45	46.20	1.36

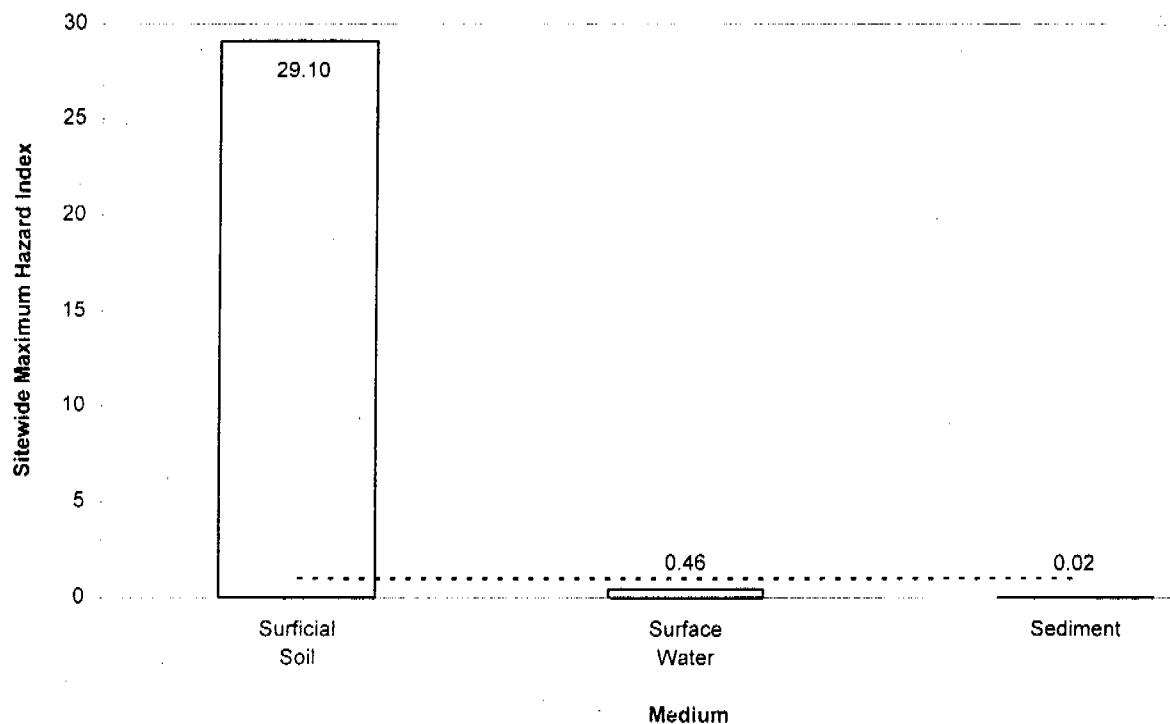
HAZARD INDEX

8.36

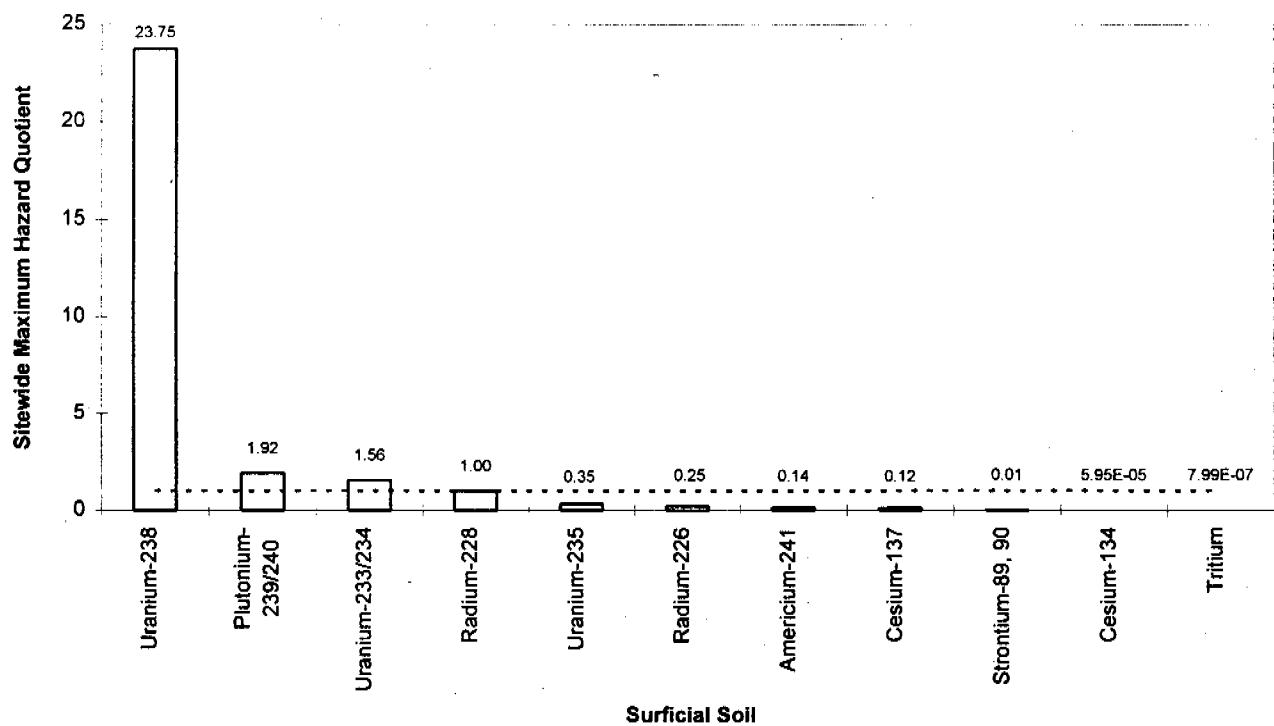
Lh2

Summary of Radiological Risk to Ecological Receptors at RFETS¹

Hazard Indices Calculated Using Maximum Detected Concentrations of Radionuclides in Abiotic Media



Hazard Quotients for Maximum Detected Concentrations of Radionuclides in Soils



¹ Risk estimates for limiting species as identified in Higley and Kuperman (1995): small mammals for soils, aquatic life for surface water and sediment.

**Comparison of Sitewide Surface Soil Maximum Radionuclide Concentrations
to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Radionuclide PCOC for Surface Soil	Sitewide Maximum Detected Concentration (pCi/g)	Sitewide Maximum Source Area	Toxicity Reference Value ¹ (pCi/g)	Sitewide Maximum Hazard Quotient
Americium-241	X	270.40	903 Pad	1900	0.14
Cesium-134		0.01	903 Pad	84	5.95E-05
Cesium-137		10.00	Old Landfill	84	0.12
Plutonium-239/240	X	7300	903 Pad	3800	1.92
Radium-226	X	1.34	903 Pad	5.4	0.25
Radium-228		3.5	903 Pad	3.5	1.00
Strontium-89, 90	X	1.24	East Trenches	120	1.03E-02
Tritium		0.28	Downgradient Areas	350000	7.99E-07
Uranium-233/234	X	2800	Old Landfill	1800	1.56E+00
Uranium-235	X	670	Old Landfill	1900	3.53E-01
Uranium-238	X	38000	Old Landfill	1600	2.38E+01

Hazard Index

29.10

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.
NC - UCL₉₅ not calculated due to insufficient number of samples.

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**Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations
in OU1 881 Hillside Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	32/32	19.32	2.61	1900.00	0.01	1.37E-03
Plutonium-239/240	X	38/38	64.97	10.80	3800.00	0.02	2.84E-03
Radium-226	X	19/19	1.09	0.92	5.40	0.20	0.17
Radium-228		19/19	2.29	1.87	3.50	0.66	0.53
Uranium-233/234	X	35/35	1.71	1.26	1800.00	9.50E-04	6.99E-04
Uranium-235	X	35/35	0.13	0.07	1900.00	6.84E-05	3.54E-05
Uranium-238	X	35/35	2.20	1.37	1600.00	1.37E-03	8.55E-04
					Hazard Index	0.89	0.71

¹Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site.
Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity,
small home ranges, and continuous contact with soil.
NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations
in OU2 903 Pad Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	47/47	270.40	41.24	1900.00	0.14	0.02
Cesium-134		2/2	0.01	0.01	84.00	5.95E-05	1.23E-04
Cesium-137		4/4	0.92	0.81	84.00	0.01	0.01
Plutonium-239/240	X	52/52	7300.00	697.16	3800.00	1.92	0.18
Radium-226	X	10/10	1.34	1.14	5.40	0.25	0.21
Radium-228		8/8	3.50	2.61	3.50	1.00	0.75
Strontrium-89, 90	X	2/2	0.52	1.00	120.00	4.33E-03	0.01
Uranium-233/234	X	33/33	3.40	1.76	1800.00	1.89E-03	9.77E-04
Uranium-235	X	33/33	0.68	0.15	1900.00	3.58E-04	7.82E-05
Uranium-238	X	33/33	7.74	2.54	1600.00	4.84E-03	1.59E-03

Hazard Index 3.33 1.18

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.

NC - UCL₉₅ not calculated due to insufficient number of samples

25

**Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations
in OU5 C-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	2/2	2.09	4.31	1900.00	1.10E-03	2.27E-03
Cesium-134	X	1/1	2.00E-03	NC	84.00	2.38E-05	NC
Cesium-137	X	1/1	0.69	NC	84.00	0.01	NC
Plutonium-239/240	X	2/2	11.80	19.93	3800.00	3.10E-03	0.01
Radium-226	X	1/1	1.23	NC	5.40	0.23	NC
Uranium-233/234	X	1/1	1.40	NC	1800.00	7.78E-04	NC
Uranium-235	X	1/1	0.07	NC	1900.00	3.47E-05	NC
Uranium-238	X	1/1	1.30	NC	1600.00	8.13E-04	NC
					Hazard Index	0.24	0.01

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*.

Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.

NC - UCL₉₅ not calculated due to insufficient number of samples

Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations in OU2 East Trenches Source Area to Toxicity Reference Values

Radionuclide PCOC	Sitetwide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	
						Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	27/27	54.00	10.18	1900.00	0.03	0.01
Cesium-134		4/4	0.01	4.54E-03	84.00	5.95E-05	5.40E-05
Cesium-137		5/5	1.58	1.49	84.00	0.02	0.02
Plutonium-239/240	X	30/30	169.53	45.66	3800.00	0.04	0.01
Radium-226	X	5/5	1.32	1.27.	5.40	0.24	0.23
Radium-228		3/3	2.28	2.53	3.50	0.65	0.72
Strontium-89, 90	X	3/3	1.24	1.49	120.00	0.01	0.01
Uranium-233/234	X	16/16	3.58	2.42	1800.00	1.99E-03	1.34E-03
Uranium-235	X	16/16	0.43	0.17	1900.00	2.26E-04	9.05E-05
Uranium-238	X	16/16	2.64	2.15	1600.00	1.65E-03	1.35E-03

¹Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site. Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.

**Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations
in North Spray Field Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	24/24	1.15	0.15	1900.00	6.04E-04	7.77E-05
Cesium-137	X	1/1	0.54	NC	84.00	0.01	NC
Plutonium-239/240	X	23/23	1.85	0.28	3800.00	4.87E-04	7.34E-05
Strontium-89, 90	X	1/1	0.14	NC	120.00	1.20E-03	NC
Tritium ²	X	1/1	-2.04E-02	NC	350000.00	-5.83E-08	NC
Uranium-233/234	X	24/24	1.79	1.22	1800.00	9.92E-04	6.75E-04
Uranium-235	X	24/24	0.11	0.06	1900.00	6.01E-05	3.03E-05
Uranium-238	X	24/24	1.75	1.20	1600.00	1.09E-03	7.50E-04
					<i>Hazard Index</i>	<i>0.01</i>	<i>1.61E-03</i>

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*.

Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.

NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Surface Soil Maximum and UCL₉₅ Radionuclide Concentrations
in Soil Dump Areas Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Soil	Detection Frequency in Soil Samples	Maximum Detected Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	63/63	3.03	0.65	1900.00	1.59E-03	3.41E-04
Cesium-134	X	1/1	1.00E-03	NC	84.00	1.19E-05	NC
Cesium-137	X	1/1	1.00E-03	NC	84.00	1.19E-05	NC
Plutonium-239/240	X	72/72	15.22	1.74	3800.00	4.01E-03	4.57E-04
Radium-226	X	1/1	1.00	NC	5.40	0.19	NC
Radium-228	X	1/1	1.90	NC	3.50	0.54	NC
Strontrium-89, 90	X	1/1	-1.20E-01	NC	120.00	-1.00E-03	NC
Tritium ²	X	6/6	0.16	0.11	350000.00	4.57E-07	3.03E-07
Uranium-233/234	X	73/73	35.41	2.24	1800.00	0.02	1.24E-03
Uranium-235	X	73/73	1.35	0.09	1900.00	7.08E-04	4.99E-05
Uranium-238	X	73/73	2.08	1.06	1600.00	1.30E-03	6.63E-04
				<i>Hazard Index</i>	0.75	2.76E-03	

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for small mammals, which represents bounding exposure based on their sensitivity, small home ranges, and continuous contact with soil.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Sitewide Sediment Maximum Radionuclide Concentrations
to Toxicity Reference Values¹**

Radionuclide PCOC	Sitewide Radionuclide PCOC for Surface Soil	Sitewide Maximum Detected Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Sitewide Maximum Hazard Quotient
Americium-241	X	389.40	46000	8.47E-03
Cesium-134		0.30	4800	6.25E-05
Cesium-137	X	2.81	4800	5.85E-04
Plutonium-239/240	X	643.40	520000	1.24E-03
Radium-226	X	5.64	380000	1.48E-05
Radium-228	X	3.41	250000	1.36E-05
Strontium-89, 90	X	3.94	35000	1.13E-04
Tritium ²	X	3.10	350000	8.86E-06
Uranium-233/234	X	25.22	10000	2.52E-03
Uranium-235	X	1.30	10000	1.30E-04
Uranium-238	X	43.09	4200	1.03E-02
Hazard Index				0.02

¹Benchmarks are from Higley and Kuperman (1995), *Radiochemical Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples.

**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU1 881 Hillside Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	3/3	0.05	0.06	46000	9.90E-07	1.23E-06
Cesium-134	X	1/1	0.13	NC	4800	2.63E-05	NC
Cesium-137	X	3/3	0.25	0.33	4800	5.28E-05	6.78E-05
Plutonium-239/240	X	4/4	17.06	14.31	520000	3.28E-05	2.75E-05
Strontium-89, 90	X	3/3	1.54	2.00	35000	4.40E-05	5.70E-05
Tritium ²	X	3/3	0.33	0.41	350000	9.43E-07	1.18E-06
Uranium-233/234	X	3/3	1.53	2.03	10000	1.53E-04	2.03E-04
Uranium-235	X	3/3	0.06	0.08	10000	5.77E-06	7.98E-06
Uranium-238	X	3/3	1.72	2.54	4200	4.09E-04	6.06E-04
		Hazard Index	7.26E-04		9.72E-04		

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.

NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU2 903 Pad Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	15/15	0.14	0.08	46000	2.96E-06	1.72E-06
Cesium-134		5/5	0.12	0.11	4800	2.46E-05	2.35E-05
Cesium-137	X	15/15	0.28	0.15	4800	5.91E-05	3.14E-05
Plutonium-239/240	X	14/14	0.87	0.51	520000	1.67E-06	9.74E-07
Radium-226	X	8/8	1.45	1.32	380000	3.82E-06	3.46E-06
Radium-228	X	8/8	1.94	1.65	250000	7.77E-06	6.58E-06
Stronitium-89, 90	X	15/15	3.94	1.15	35000	1.13E-04	3.29E-05
Tritium ²	X	9/9	0.65	0.31	350000	1.86E-06	8.81E-07
Uranium-233/234	X	15/15	1.47	1.00	10000	1.47E-04	1.00E-04
Uranium-235	X	15/15	0.17	0.07	10000	1.72E-05	6.87E-06
Uranium-238	X	15/15	1.88	1.27	4200	4.48E-04	3.02E-04
					Hazard Index	5.11E-04	5.11E-04
						8.26E-04	

¹Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU5 Ash Pits Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	4/4	0.03	0.03	46000	6.12E-07	5.95E-07
Cesium-137	X	3/3	1.00	1.25	4800	2.08E-04	2.61E-04
Plutonium-239/240	X	6/6	0.04	0.03	520000	7.33E-08	4.84E-08
Radium-226	X	2/2	0.95	2.12	380000	2.50E-06	5.57E-06
Radium-228	X	1/1	1.30	NC	250000	5.21E-06	NC
Strontrium-89, 90	X	4/4	0.36	0.37	35000	1.02E-05	1.07E-05
Tritium ²	X	6/6	0.61	0.46	350000	1.74E-06	1.31E-06
Uranium-233/234	X	5/5	3.69	2.83	10000	3.69E-04	2.83E-04
Uranium-235	X	5/5	0.14	0.11	10000	1.42E-05	1.12E-05
Uranium-238	X	5/5	3.27	2.55	4200	7.78E-04	6.08E-04
					Hazard Index	1.39E-03	1.18E-03

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU6 A-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad POC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	35/35	13.23	2.95	46000	2.88E-04	6.40E-05
Cesium-134		12/12	0.10	0.06	4800	2.08E-05	1.31E-05
Cesium-137	X	37/37	0.69	0.36	4800	1.43E-04	7.56E-05
Plutonium-239/240	X	36/36	36.20	7.65	520000	6.96E-05	1.47E-05
Radium-226	X	10/10	3.08	2.60	380000	8.11E-06	6.84E-06
Radium-228	X	12/12	2.04	1.83	250000	8.16E-06	7.31E-06
Stronitium-89, 90	X	24/24	1.80	0.70	35000	5.14E-05	2.00E-05
Tritium ²	X	37/37	0.35	0.10	350000	9.95E-07	2.98E-07
Uranium-233/234	X	37/37	3.67	1.98	10000	3.67E-04	1.98E-04
Uranium-235	X	37/37	0.27	0.10	10000	2.74E-05	9.95E-06
Uranium-238	X	38/38	6.33	2.63	4200	1.51E-03	6.27E-04
					Hazard Index	2.49E-03	1.04E-03

¹Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

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**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU6 B-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad POC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	44/44	389.40	59.60	46000	8.47E-03	1.30E-03
Cesium-134		10/10	0.05	0.05	4800	1.04E-05	9.86E-06
Cesium-137	X	44/44	2.81	0.75	4800	5.85E-04	1.56E-04
Plutonium-239/240	X	37/37	643.40	112.16	520000	1.24E-03	2.16E-04
Radium-226	X	20/20	5.64	2.50	380000	1.48E-05	6.58E-06
Radium-228	X	21/21	2.18	1.76	250000	8.70E-06	7.04E-06
Strontium-89, 90	X	25/25	1.02	0.40	35000	2.90E-05	1.15E-05
Tritium ²	X	37/37	1.73	0.42	350000	4.94E-06	1.21E-06
Uranium-233/234	X	43/43	25.22	6.66	10000	2.52E-03	6.06E-04
Uranium-235	X	43/43	1.30	0.35	10000	1.30E-04	3.46E-05
Uranium-238	X	43/43	43.09	9.47	4200	1.03E-02	2.25E-03
					Hazard Index	0.02	4.60E-03

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in OU5 C-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	34/34	0.46	0.16	46000	1.00E-05	3.43E-06
Cesium-134	X	5/5	0.20	0.16	4800	4.17E-05	3.41E-05
Cesium-137	X	20/20	0.70	0.31	4800	1.46E-04	6.39E-05
Plutonium-239/240	X	33/33	2.40	0.86	520000	4.62E-06	1.66E-06
Radium-226	X	11/11	2.00	1.46	380000	5.26E-06	3.83E-06
Radium-228	X	12/12	3.41	2.34	250000	1.36E-05	9.35E-06
Srontium-89, 90	X	25/25	2.40	0.54	35000	6.86E-05	1.55E-05
Tritium ²	X	27/27	0.57	0.22	350000	1.63E-06	6.40E-07
Uranium-233/234	X	28/28	3.50	1.57	10000	3.50E-04	1.57E-04
Uranium-235	X	29/29	0.14	0.07	10000	1.40E-05	6.98E-06
Uranium-238	X	28/28	3.00	1.45	4200	7.14E-04	3.44E-04
					Hazard Index	1.37E-03	6.41E-04

¹Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.

NC - UCL₉₅ not calculated due to insufficient number of samples

262

**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in Downgradient Areas Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	4/4	0.01	0.01	46000	2.71E-07	2.94E-07
Cesium-134		1/1	0.06	NC	4800	1.26E-05	NC
Cesium-137	X	5/5	0.88	0.60	4800	1.83E-04	1.26E-04
Plutonium-239/240	X	5/5	0.03	0.02	520000	5.29E-08	4.20E-08
Radium-226	X	3/3	1.33	1.46	380000	3.50E-06	3.85E-06
Radium-228	X	3/3	1.98	2.18	250000	7.90E-06	8.71E-06
Strontrium-89, 90	X	5/5	0.71	0.56	35000	2.04E-05	1.59E-05
Tritium ²	X	4/4	2.32	1.97	350000	6.63E-06	5.62E-06
Uranium-233/234	X	4/4	1.00	1.21	10000	1.00E-04	1.21E-04
Uranium-235	X	4/4	0.08	0.08	10000	8.31E-06	8.39E-06
Uranium-238	X	4/4	1.10	1.33	4200	2.62E-04	3.16E-04
					Hazard Index	6.04E-04	6.05E-04

¹Benchmarks are from Higley and Kuperman (1995). Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

263

**Comparison of Sediment Maximum and UCL₉₅ Radionuclide Concentrations
in Old Landfill Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Sediment	Detection Frequency in Sediment Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration (pCi/g)	Toxicity Reference Value ¹ (pCi/g) ²	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	2/2	0.22	0.61	46000	4.78E-06	1.33E-05
Cesium-134	X	1/1	0.30	NC	4800	6.25E-05	NC
Cesium-137	X	1/1	0.20	NC	4800	4.17E-05	NC
Plutonium-239/240	X	2/2	0.88	2.21	520000	1.69E-06	4.25E-06
Strontium-89, 90	X	1/1	0.06	NC	35000	1.60E-06	NC
Tritium ²	X	2/2	3.10	10.86	350000	8.86E-06	3.10E-05
Uranium-233/234	X	1/1	0.66	NC	10000	6.60E-05	NC
Uranium-235	X	1/1	0.03	NC	10000	2.90E-06	NC
Uranium-238	X	1/1	1.20	NC	4200	2.86E-04	NC
					Hazard Index	4.76E-04	4.85E-05

¹Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the sediments.

²Tritium was measured in pCi/L; this screen assumes 1 kg tritium is equivalent to 1 L tritium.
NC - UCL₉₅ not calculated due to insufficient number of samples

**Comparison of Sitewide Surface Water Maximum Radionuclide Concentrations
to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Radionuclide PCOC for Surface Water	Sitewide Maximum Concentration (pCi/g)	Toxicity Reference Value ² (pCi/g)	Sitewide Maximum Hazard Quotient
Americium-241	X	15	1300	1.15E-02
Cesium-137	X	2	8200	2.44E-04
Plutonium-239/240	X	42.25	100	0.42
Radium-226		0.52	380	1.36E-03
Strontium-89, 90	X	3.08	270000	1.14E-05
Tritium	X	3600	190000000	1.89E-05
Uranium-233/234	X	19.98	4300	4.65E-03
Uranium-235	X	3.03	4300	7.05E-04
Uranium-238	X	74	4400	1.68E-02
<i>Hazard Index</i>		0.46		

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.

NC - UCL₉₅ not calculated due to insufficient number of samples.

265

**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OU1 881 Hillside Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	170/170	0.56	0.03	1300.00	4.29E-04	2.01E-05
Cesium-137	X	115/115	2.00	0.20	8200.00	2.44E-04	2.41E-05
Plutonium-239/240	X	162/162	0.11	0.01	100.00	1.10E-03	1.09E-04
Radium-226		13/13	0.38	0.26	380.00	1.00E-03	6.93E-04
Strontium-89, 90	X	66/66	3.08	0.51	270000.00	1.14E-05	1.90E-06
Tritium	X	159/159	700.00	163.73	19000000.00	3.68E-06	8.62E-07
Uranium-233/234	X	99/99	7.05	2.57	4300.00	1.64E-03	5.99E-04
Uranium-235	X	99/99	1.58	0.18	4300.00	3.67E-04	4.11E-05
Uranium-238	X	99/99	21.82	2.85	4400.00	4.96E-03	6.47E-04
				Hazard Index	0.01	2.14E-03	

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.
NC - UCL₉₅ not calculated due to insufficient number of samples.

266

**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OU2 903 Pad Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	18/18	2.70	0.83	1300.00	2.08E-03	6.38E-04
Cesium-137	X	16/16	1.28	0.53	8200.00	1.56E-04	6.42E-05
Plutonium-239/240	X	20/20	42.25	8.66	100.00	0.42	0.09
Radium-226		5/5	0.52	0.42	380.00	1.36E-03	1.11E-03
Strontium-89, 90	X	11/11	0.74	0.54	270000.00	2.74E-06	2.00E-06
Tritium	X	28/28	3600.00	504.24	19000000.00	1.89E-05	2.65E-06
Uranium-233/234	X	9/9	19.98	10.81	4300.00	4.65E-03	2.51E-03
Uranium-235	X	10/10	0.63	0.40	4300.00	1.47E-04	9.22E-05
Uranium-238	X	9/9	15.00	7.85	4400.00	3.41E-03	1.78E-03
					<i>Hazard Index</i>	0.43	0.09

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*.

Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.

NC - UCL₉₅ not calculated due to insufficient number of samples.

267

**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OUS Ash Pits Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	33/33	0.16	0.02	1300.00	1.25E-04	1.27E-05
Cesium-137	X	26/26	0.74	0.19	8200.00	9.02E-05	2.32E-05
Plutonium-239/240	X	33/33	0.04	0.01	100.00	3.80E-04	7.83E-05
Radium-226		1/1	0.22	NC	380.00	5.79E-04	NC
Strontium-89, 90	X	15/15	1.09	0.71	270000.00	4.04E-06	2.61E-06
Tritium	X	30/30	280.00	106.06	190000000.00	1.47E-06	5.58E-07
Uranium-233/234	X	24/24	1.37	0.69	4300.00	3.19E-04	1.60E-04
Uranium-235	X	24/24	0.43	0.10	4300.00	1.00E-04	2.33E-05
Uranium-238	X	24/24	1.72	0.57	4400.00	3.91E-04	1.30E-04
					Hazard Index	1.99E-03	4.31E-04

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.
NC - UCL₉₅ not calculated due to insufficient number of samples.

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**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OU6 A-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad POC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	25/25	0.02	0.01	1300.00	1.54E-05	6.00E-06
Cesium-137	X	8/8	0.46	0.24	8200.00	5.67E-05	2.89E-05
Plutonium-239/240	X	25/25	0.05	0.02	100.00	5.27E-04	1.82E-04
Strontium-89, 90	X	25/25	1.54	0.51	270000.00	5.71E-06	1.88E-06
Tritium	X	23/23	252.40	100.24	190000000.00	1.33E-06	5.28E-07
Uranium-233/234	X	25/25	3.69	1.88	4300.00	8.58E-04	4.37E-04
Uranium-235	X	25/25	0.37	0.13	4300.00	8.60E-05	3.06E-05
Uranium-238	X	25/25	4.48	2.57	4400.00	1.02E-03	5.84E-04
				Hazard Index	2.57E-03	1.27E-03	

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.

NC - UCL₉₅ not calculated due to insufficient number of samples.

**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OU6 B-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad POC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	26/26	0.04	0.02	1300.00	2.89E-05	1.41E-05
Cesium-137	X	10/10	0.33	0.12	8200.00	4.04E-05	1.52E-05
Plutonium-239/240	X	26/26	0.08	0.02	100.00	7.60E-04	2.35E-04
Strontium-89, 90	X	26/26	1.37	0.59	270000.00	5.09E-06	2.20E-06
Tritium	X	22/22	343.00	175.43	190000000.00	1.81E-06	9.23E-07
Uranium-233/234	X	26/26	3.57	1.32	4300.00	8.30E-04	3.08E-04
Uranium-235	X	26/26	0.56	0.16	4300.00	1.30E-04	3.79E-05
Uranium-238	X	26/26	3.20	1.09	4400.00	7.27E-04	2.47E-04
					Hazard Index	2.52E-03	8.60E-04

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kupperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.

NC - UCL₉₅ not calculated due to insufficient number of samples.

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**Comparison of Surface Water Maximum and UCL₉₅ Radionuclide Concentrations
in OU5 C-Ponds Source Area to Toxicity Reference Values**

Radionuclide PCOC	Sitewide Rad PCOC for Surface Water	Detection Frequency in Surface Water Samples	Maximum Concentration (pCi/g)	UCL ₉₅ Concentration ¹ (pCi/g)	Toxicity Reference Value ² (pCi/g)	Max Hazard Quotient	UCL ₉₅ Hazard Quotient
Americium-241	X	50/50	15.00	0.85	1300.00	0.01	6.55E-04
Cesium-137	X	34/34	0.85	0.29	8200.00	1.04E-04	3.57E-05
Plutonium-239/240	X	51/51	0.32	0.04	100.00	3.17E-03	3.97E-04
Strontium-89, 90	X	20/20	1.81	0.73	270000.00	6.70E-06	2.70E-06
Tritium	X	64/64	480.00	116.90	19000000.00	2.53E-06	6.15E-07
Uranium-233/234	X	35/35	3.73	1.58	4300.00	8.67E-04	3.69E-04
Uranium-235	X	35/35	3.03	0.30	4300.00	7.05E-04	6.92E-05
Uranium-238	X	35/35	4.27	1.45	4400.00	9.70E-04	3.29E-04
				Hazard Index	0.02	2.59E-03	

¹Total (unfiltered) concentration.

²Benchmarks are from Higley and Kuperman (1995), *Radiological Benchmarks for Wildlife at Rocky Flats Environmental Technology Site*. Value is the ecotoxicological benchmark for aquatic species, which represents bounding exposure based on their sensitivity and continuous contact with the surface water.
NC - UCL₉₅ not calculated due to insufficient number of samples.